

STATE, FOREIGN OPERATIONS, AND RELATED PROGRAMS APPROPRIATIONS FOR FISCAL YEAR 2016

THURSDAY, MARCH 26, 2015

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10:05 a.m., in room SD-192, Dirksen Senate Office Building, Hon. Lindsey Graham (chairman) presiding.

Present: Senators Graham, Blunt, Boozman, Moran, Daines, Leahy, Coons, Merkley, and Murphy.

DIPLOMACY, DEVELOPMENT, AND NATIONAL SECURITY

STATEMENTS OF:

BILL GATES, CO-CHAIR, THE BILL & MELINDA GATES FOUNDATION

BEN AFFLECK, ACTOR, FILMMAKER, AND FOUNDER OF EASTERN CONGO INITIATIVE

JOHN MEGRUE, CHAIRMAN, APAX PARTNERS U.S. AND CHAIRMAN OF BORN FREE AFRICA

ADMIRAL JAMES STAVRIDIS, USN, RETIRED, SUPREME ALLIED COMMANDER AT NATO, 2009-2013, AND CO-CHAIR, U.S. GLOBAL LEADERSHIP COALITION NATIONAL SECURITY ADVISORY COUNCIL

SCOTT FORD, CHIEF EXECUTIVE OFFICER, WESTROCK GROUP, LLC, AND FORMER CHIEF EXECUTIVE OFFICER, ALLTEL CORPORATION

OPENING STATEMENT OF SENATOR LINDSEY GRAHAM

Senator GRAHAM. The subcommittee will come to order.

Our hearing today is on Diplomacy, Development, and National Security, and we have an incredible panel of great Americans in their own way. Balancing the schedules of these gentlemen had to be very difficult, and each and every one of you made a sacrifice to be here. You had other places you could go and probably needed to go, but the fact you would come here and share your testimony, your experiences, your thoughts and opinions about the 150 account means a great deal to Senator Leahy and myself.

As to Senator Leahy, we have been partners here for several years on this account. I have thoroughly enjoyed working with him and Tim Rieser, and this is one area of the Government that we are trying to make sure actually works. Our relationship has grown

over time, and we are both committed to making sure that America stays involved in the world in a productive fashion.

Our panel today consists of Mr. Bill Gates, Co-chairman of the Bill & Melinda Gates Foundation; founder of Microsoft. Ben Affleck, an actor, filmmaker, and founder of the Eastern Congo Initiative, which I visited, and you are doing great work in a very troubled area of the world. John Megrue is Chairman of the Apax Partners U.S. and Chairman of Born Free Africa and has been working with the United Nations particularly dealing with the mother-to-child AIDS transmissions. Thank you very much, John. Admiral Stavridis is the former North Atlantic Treaty Organization (NATO) Commander, is now the Dean at the Fletcher School of Law and Diplomacy at Tufts University. He wore the uniform for many years, many decades, and I really look forward to your view as a military commander about this account. And Scott Ford is the Chief Executive Officer of Westrock Group and former Chief Executive Officer of Alltel. And I have had the pleasure to see what Scott has been able to do in Rwanda regarding the coffee market.

So all of you are welcome, and I will let the first statement be by Senator Leahy, if he would like.

STATEMENT OF SENATOR PATRICK J. LEAHY

Senator LEAHY. Well, thank you, Mr. Chairman. I think what is probably the most important is that we hear from the people who are here.

We talk about diplomacy, development, and national security. That is really relevant, probably any time since World War II. We know that there are limits to what our military can do. And, Admiral, I am delighted you are here. We discussed this before. We have this huge economic and military power, but we ought to be showing the rest of the world some of the best parts of us. I talked with Mr. Gates earlier. When Senator Graham and I told our colleagues that they ought to pony up on money on infectious diseases, a country of 320 million Americans ought to be able to at least match what Bill and Melinda Gates were doing.

But also we know that we have some problems with development, with funding large contractors and non-governmental organizations (NGO's) that might make a lot of money for the ones putting it together, but I am worried that we do not see what we want to see.

And I think that with the cuts in the House and Senate budget, we are going to have difficulties. I think we have to look at what actually makes life better for the people we are dealing with, but also for our own country. I like going into a small country and we find that one of our programs is actually about the only medical team that has ever been there, or the areas where we worked on land mines, or the school that now has books. Instead of one book, they have a book for everybody. These are the things that show what is best in America; a lot more than some of these huge things.

But I have worked with Senator Graham over the years. Part of the time, he has been chairman; part of the time, I have been chairman. We try to make this as non-partisan a bill as possible, and we will continue to do that. He is a good friend. He under-

stands this program as well as any Member of the Senate, either party that I serve with.

Senator GRAHAM. Thank you, Mr. Chairman.

Very briefly, contrary to popular opinion, the foreign assistance account is 1 percent of the Federal budget. You can eliminate every penny we spend and not even move the debt needle 1 inch. So to those who constantly demagogue foreign aid as being the root of our financial problems, please stop because you do not know what the hell you are talking about.

This account is designed to show who we are as a Nation. It is designed to enhance our national security. It is designed to deal with enemies of mankind such as radical Islam, AIDS, malaria, and a lot of other disease, poverty. It is designed to build people up so that we can live in peace with them, they can have a better life, and make the world a safer place. It is designed to have an American presence that is nonlethal. You cannot protect America by just dropping bombs on people.

This account in many ways is the best line of defense in terms of Africa. We do not have a large military presence in Africa, but in a bipartisan fashion, we have had developmental programs fighting AIDS and malaria, trying to resolve conflicts in Africa. And this account has been the front line.

The return on investment on behalf of the American taxpayer from this account—I will match it with any place in the budget. I have never seen what a small amount of money can do in a positive way better than here. It is \$50-something billion and that is a lot of money, but in the budget it is a rounding error. The amount of money we have appropriated each and every year is leveraged by the private sector, and each one of you come from the private sector. In partnership with your Government, non-governmental organizations, faith-based organizations, the Gates Foundation, you just name it—we have created partnerships that every American I think should be proud of.

And the day that we stop doing what this account represents, our best days are behind us. We will have chosen a path that no generation of Americans have ever chosen before, one of indifference, one of isolationism, one of we are not really responsible or the leading voice in the world. We are. And this account represents that philosophy. It is a good investment on behalf of the taxpayer. What you have received in rates of return you cannot measure: an entire generation of young African children being saved from the scourge of AIDS, turning the corner on malaria. In the Congo, what Mr. Affleck has done in cooperation with NGO's and the government is to take hell on earth and make it a bit better. And to Mr. Ford, what you have proven the private sector can do is just astounding.

So thank you all. We look forward to hearing your testimony.

As we speak today, there will be a vote on the floor of the United States Senate where a Member of the Senate is chosen to reduce this account by 50 percent and give that money to the military. Here is what I would say on behalf of the military. They do not want this money. They want this account to survive and thrive.

General Mattis told me probably the best explanation of how this account plays in the world as it is. He said, Senator, if you do away with the 150 account, if we withdraw from the world and these pro-

grams go away, you better buy me more ammo. I could not say it better myself.

So since Republicans are in charge, we are going to start from the right with Mr. Gates.

SUMMARY STATEMENT OF BILL GATES

Mr. GATES. Good morning, Mr. Chairman, Senator Leahy, and other members of the subcommittee. Thank you for the opportunity to talk with you about the importance of U.S. foreign assistance.

Melinda and I, in writing our annual letter for the foundation, talked about what great things can happen if the United States and other countries maintain the generosity that they have had through this account. Over the next 15 years, there are some amazing things that can be achieved.

If we go back to 1960, we had a very dire situation. One child in five died before their fifth birthday. Twenty-five years ago, by 1990, that rate was down to 1 in 10, and since then it has been cut in half again to 1 in 20. With the right investments over the next 15 years, we will be able to cut it in half again to 1 in 40. That is a faster improvement than we have ever seen in the past.

And there are many U.S. programs that are absolutely central to this decline in child mortality and to other gains in health and development worldwide.

One specific program that makes a huge difference is the Global Alliance for Vaccines and Immunization (GAVI), the vaccine alliance. This public-private partnership creates a market for companies to develop vaccines that protect children in poor countries against the most common causes of death and severe illness. As an American, I am proud that the United States Government is one of GAVI's biggest donors. Since its inception in the year 2000, GAVI has helped immunize close to half a billion children and prevented over 7 million deaths. I can assure you that the parents of those children would be glad to vouch for the simple fact that vaccines are safe, vaccines are effective, vaccines save lives.

Another great example of this is the fight against polio. The number of countries where that disease is endemic has gone from 125 in 1988 to just three today.

In this year's annual letter, Melinda and I predict that Africa will be self-sufficient in food production within 15 years. Here too we are seeing great progress, much of it made possible by U.S. assistance. The U.S. has a major impact in improving agricultural productivity in poor countries through USAID and USDA support for agricultural research in partnership with our land grant universities.

In my written testimony, I discuss a number of U.S. programs that are delivering high returns on investment and having a positive impact for the global poor.

But there is another area where foreign assistance will make a huge difference not only for the people of the world's poorest nations but for the people of this Nation as well.

As you know, I tend to be optimistic about what the future holds, but there are a small number of potentially catastrophic events that could set back the progress of the past two decades. The most plausible and most frightening of these threats is a large epidemic.

As I note in my recent New England Journal of Medicine and New York Times articles, I am talking about something bigger than the Ebola outbreak we have seen in West Africa. Ebola is not a disease that spreads very easily. What concerns me most is the prospect of an even more lethal disease which is also highly contagious. We have seen outbreaks like this in the past such as the flu pandemic of 1918 and 1919 which had a worldwide death toll of 30 million to 50 million. Could an epidemic of this scale happen again? Yes, it could, and in today's far more urbanized and interconnected world, it would spread far more easily than a century ago.

I have come to Congress on other occasions to ask for the sustainment of U.S. foreign assistance. I have grounded this appeal in our shared moral interest in preventing needless deaths and suffering and also in our economic and security self-interest. With Ebola and the very real prospect of an even more infectious disease, the case is now even clearer. I am asking you to support foreign assistance programs not only as a highly effective way to help other countries become more self-sufficient, but also as a necessary means of protecting this country from a future epidemic.

The sensible place to begin is with investments in basic health services in those parts of the world that are most susceptible to outbreaks of infectious disease. Whether we are talking about preventing the next epidemic or building upon the enormous global health gains of the past two decades, the time to act is now. The need for foreign assistance remains strong, and recent events demonstrate its urgency.

Thank you for inviting me to join you today. I look forward to your questions.

[The statements follow:]

PREPARED STATEMENT OF BILL GATES

Mr. Chairman, Senator Leahy, members of the subcommittee—thank you for this opportunity to talk with you about an important subject: the role of U.S. development assistance in helping people in the world's poorest nations attain greater self-sufficiency.

In January, my wife Melinda and I put out our annual letter. In it, we wrote about "our big bet for the future"—that the lives of people in poor countries will improve faster in the next 15 years than at any other time in history.

In my brief time before you today, I'll make three basic points:

- First, that this "big bet"—while ambitious—is indeed attainable, based on the extraordinary progress that we've seen in recent years.
- Second, that achieving further gains against extreme poverty and disease in the world's poorest countries would have significant benefits for the American people.
- And third, that these gains require sustained U.S. commitment to overseas development assistance. Together with the leadership and commitment of the countries in which we work, we can make historic progress—right now—against extreme poverty and disease.

I'll now touch on each of these points in turn.

First, the progress that the world has made against disease and extreme poverty is truly extraordinary. It should leave no doubt that we now have an opportunity for historic advances in the well-being of humanity—particularly in poor countries.

The most important single measurement of progress in global health is the child-mortality rate—and its trajectory has been astonishing to watch.

Worldwide, in 1960 about one child in five died before his or her fifth birthday.

By 1990—25 years ago—that rate had been cut in half, to 1 in 10.

Since then, it's been cut in half again, to 1 in 20.

We now have the tools to halve this rate yet again, to 1 in 40, and to do it even faster—within 15 years.

What accounts for this?

One very important factor is the investment by governments around the world in their own nations' health and development. But that's not the only factor at work here.

Global economic growth; changes in trade policy; and the spread of new technologies have all contributed to fundamental improvements in human health and well-being.

But there's another indispensable factor: overseas development assistance, notably from the United States.

Working with other national governments and donor partners, U.S. Government investments have contributed to these amazing declines in child mortality—and to other gains in health and development worldwide.

I'll mention just a few specific examples of U.S.-supported programs that have made an enormous difference.

One of these is Gavi, the Vaccine Alliance. This is a public-private partnership that pools the demand for vaccines among the world's poorest nations. It then provides long-term financing through a number of sources—including from the recipient nations themselves—to meet that demand.

This creates a viable market for pharmaceutical and biotech companies to develop vaccines, and increases healthy competition among them. That, in turn, helps drive down prices for vaccines that protect young children from the most common causes of death and severe illness—including diarrhea, pneumonia, and measles.

It's a brilliant model, and a very effective one. Since its inception in 2000, Gavi has helped immunize close to half a billion children and prevented 7 million deaths.

I'm proud that our foundation is a contributor to Gavi—and, as an American, I'm proud that this country is one of Gavi's biggest donor nations.

At the Gavi replenishment conference in January, the organization met its target amount of \$7.5 billion. The U.S. made a generous pledge of \$1 billion to Gavi over 4 years, including fiscal year 2015.

The new replenishment round will allow Gavi to immunize another 300 million children and save the lives of 5 million to 6 million children.

And I can assure you, members of the subcommittee, that the parents of those children would be glad to vouch for a simple fact: *Vaccines are safe; vaccines are effective; vaccines save lives.*

Speaking of the life-saving power of vaccines, another great example of progress and partnership has been the worldwide campaign against polio. Here too, the policy choices of the U.S. Government have been decisive.

The United States has been a strong supporter of the Global Polio Eradication Initiative (GPEI)—the Centers for Disease Control and Prevention was one of the original partners, along with Rotary International, the WHO, and UNICEF.

Since 1985, the U.S. has provided more than \$2 billion to GPEI. At the time of the initial U.S. investment, eradicating polio seemed like a fantasy—the disease was endemic in 125 countries around the world and paralyzed about 350,000 people each year, mainly young children.

Less than three decades later, polio is endemic in only three countries—Pakistan, Afghanistan, and Nigeria. Actually, we may soon be down to two, since Nigeria had only a handful of cases in 2014 and may be on the verge of eliminating the disease there. Worldwide, the number of polio cases last year was less than 400.

The good news of the past couple decades even extends to some of the most lethal infectious diseases, such as HIV/AIDS and malaria.

Since 2000, among children under five worldwide, deaths from AIDS have declined by 50 percent, while deaths from malaria have gone down 80 percent.

For the world population as a whole, the global incidence of HIV has gone down by 20 percent since its peak in the mid-1990s, and the mortality rate for malaria has declined by 42 percent since 2000.

These significant gains would not have been possible without major programs supported entirely or in part by the Government of the United States: the President's Malaria Initiative, or PMI; the United States President's Emergency Plan for AIDS Relief, or PEPFAR; and the Global Fund to fight AIDS, Tuberculosis and Malaria—to which the U.S. is the top donor.

In addition to historic gains against disease, we are seeing progress in maternal, newborn, and child health. Investing in women and children yields broad economic and social benefits that help build prosperous communities and nations.

The U.S. has been a leader in the campaign to end preventable child and maternal deaths—and worldwide, more women survive pregnancy and childbirth than ever before.

As Melinda and I discuss in our annual letter, we believe that even faster progress is possible—and necessary—over the next 15 years.

In this year's annual letter, Melinda and I also predict that Africa will be self-sufficient in food production within 15 years.

This would be an enormously significant milestone. Experience shows that the path for countries to escape poverty is almost always through agricultural development—as it was for the United States itself.

Agriculture is also closely linked to nutrition and health. Every year, undernutrition contributes to 3.1 million child deaths—45 percent of the worldwide total. It also costs low- and middle-income countries up to 8 percent of their economic growth potential.

Since 1990, the world has seen a 37 percent drop in stunting as a result of better nutrition. The U.S. helped improve nutrition levels for more than 12.5 million children in developing countries last year.

The U.S. has a major impact in improving agricultural productivity in poor nations through USAID and USDA support for agricultural research, in partnership with our land-grant universities.

This research typically generates at least a 20:1 return on investment. In developing countries, the returns are even greater.

And according to the World Bank, every dollar invested in agriculture is twice as effective at reducing poverty as investments in non-agricultural sectors.

Given that 70 percent of all people living in extreme poverty are in rural areas, and most are engaged in farming, the renewed U.S. commitment to agricultural development represents a very sensible, cost-effective approach to reducing global poverty.

In 2013 alone, the Feed the Future initiative helped nearly 7 million farmers and food producers adopt new technologies and management practices. It also supported nearly 91,000 female farmers in homestead gardening—improving access to nutrient-dense foods; increasing income for women and children; and helping families become economically self-sufficient.

This brings me to the second of my three points: While the lives of people in poor countries will improve more than anyone else's over the next decade and a half, that improvement will have very positive consequences for the people of the United States.

One reason for this is that the American people value the qualities of self-sufficiency and independence—for ourselves and for other people around the world. We want people in poorer countries to have the tools to improve their own circumstances in a way that's sustainable and lasting for them.

We don't want to see poor nations stay poor, or to remain dependent on outside aid. We want them to be able to stand on their own two feet—and that's exactly what the people of those countries want for themselves.

When overseas development assistance is done right—as with the programs I've cited today—this is exactly what happens.

We have seen this pattern play out across much of the world. Several countries that were once major aid recipients—South Korea, Brazil, Malaysia, Morocco, Botswana, to name a few—are now self-sufficient, and some have even become donor countries themselves.

Several have become U.S. allies and partners, as well as export markets for our farmers and manufacturers: Nigeria is the third-largest U.S. wheat market; Angola is the fourth-largest broiler-meat market; and Ghana ranks as one of the top 10 rice markets.

In short, it's in the interests of the American people to see more and more countries complete this development cycle—to make the transition from *aid recipients* to *full participants* in the international system.

U.S. health and development assistance programs have been vitally important in helping countries around the world make that transition. This process is gaining momentum in many low-income nations today—particularly in Sub-Saharan Africa.

But there's another major reason why progress on health and economic development in the world's poorest countries is in the interest of the American people.

As you know, I tend to be very optimistic about what the future holds. But there are a small number of potentially catastrophic events that could seriously set back all the progress of the past few decades. The most plausible—and most frightening—of these threats is a large-scale epidemic.

I discuss this prospect in my recent New England Journal of Medicine and New York Times articles; I'll talk about it briefly here today.

By a "large-scale epidemic," I'm talking about something much bigger than the terrible Ebola outbreak we've seen in West Africa, which has taken more than 10,000 lives.

Ebola, for all its horrors, is not a disease that spreads very easily. What concerns me most is the prospect of a highly lethal disease that is also highly contagious.

We have seen such outbreaks in the past, such as during the influenza pandemic of 1918 and 1919, which had a worldwide death toll generally estimated between 30 million and 50 million.

That included about 675,000 deaths here in the United States—at a time when the national population was about one-third as large as it is today. The outbreak was so severe in this country that over the course of a single year, life expectancy in the U.S. fell by about 12 years.

Could an epidemic of this scale happen again? Yes, it could—and in today's far more urbanized and interconnected world, it could spread from continent to continent, and from community to community, far more easily than it could a century ago.

Members of the subcommittee, I've come to Congress on other occasions to ask for the sustainment of U.S. overseas development assistance.

I have grounded this appeal not only in our shared moral interest in preventing needless death and suffering, but also in our economic and security interests. All these dimensions remain strong interests of mine, and I know they are strong interests of yours, as well.

The Ebola tragedy has made our national interest in this effort clearer than ever before. I am asking you to support our assistance programs both as a highly effective means of helping other countries become more self-sufficient, and as a necessary means of protecting *this country* from a future epidemic.

Such an epidemic might start far away, but could spread to the U.S. on a considerably larger scale, and with much greater speed, than any current form of Ebola. It's impossible to predict the human toll or the economic consequences that would result. According to the World Bank, a worldwide flu epidemic would reduce global wealth by \$3 trillion, not to mention the immeasurable suffering that would accompany widespread illness and loss of life.

The wise course is to invest manageable amounts now to prevent future outbreaks—rather than trying to contend with the unpredictable and potentially enormous costs of a trans-continental epidemic.

The sensible place to begin is with investments in basic health services in those parts of the world that are most susceptible to outbreaks of infectious disease.

As we have seen with the Ebola epidemic, the world's poorest countries remain acutely vulnerable to health crises that can render them unable to support their own people or build their own economies.

This epidemic is also a reminder that infectious diseases don't respect national borders. In the interconnected world of the 21st century, a non-functional health system anywhere can create problems *everywhere*.

It is imperative that we learn the right lessons from the Ebola emergency. Perhaps the most urgent of those lessons is the paramount importance of bringing health systems up to a level of at least basic adequacy in as many places as possible.

The process begins, of course, with the recipient nations themselves—which must invest in the health of their own people, in partnership with external donors.

This had already happened in enough areas of Nigeria, Senegal, and Mali to prevent Ebola from spreading farther in those countries—and thank goodness for that, since any expansion of the outbreak to large urban areas like Lagos or Bamako could have immensely increased both the death toll and the complexity of this epidemic.

To its great credit, the United States has played a leading role in responding to the West African Ebola outbreak. Our challenge now is to maintain the effort and the investment required to ensure we're better prepared for future epidemics.

This includes investment in a range of vital systems: primary healthcare; disease monitoring; and data collection—as well as such basic medical tools as vaccines, therapeutics, diagnostics, and transfusion processes.

But in some ways, the main problem with U.S. epidemic preparedness is not our level of investment—though that will also need to improve—but our lack of optimal coordination across agencies.

Within the U.S. Government, there are multiple agencies engaged in epidemic response at some level—either directly, or indirectly through the development of guidelines or technical expertise.

These include the Centers for Disease Control and Prevention; the National Institutes of Health (NIH); the Food and Drug Administration; the Defense Threat Reduction Agency (DTRA) and the Defense Advanced Research Projects Agency (DARPA) at the Department of Defense; the Department of Health and Human Services Office of the Assistant Secretary for Preparedness and Response (ASPR); and several others.

Consider the Government's response to the Ebola epidemic: Just within the area of research and development, we had the development of ZMapp, which was funded by the Biomedical Advanced Research and Development Authority within ASPR; a lead vaccine candidate funded by NIH; a diagnostic test funded by DTRA; and additional technological approaches funded by DARPA.

Such diversity of agencies engaged in a shared challenge is by no means necessarily a problem. It can even be a strength. But particularly when it comes to R&D, we need better coordination and transparency. That includes a greater awareness of what is being funded and studied across agencies, so that we may avoid unnecessary duplication of effort; derive maximum leverage from what's already being done; and advance the state of research as much as possible.

There's one more reason why improvements in cross-agency coordination—and, where needed, additional investments—make enormous sense: They will be worth it even if a large-scale epidemic never happens.

That's because the measures that will enable us to respond effectively to a major disease outbreak are the same ones that will equip us to help other countries:

- limit the spread of infectious disease;
- reduce child mortality;
- protect the health of expectant and delivering mothers;
- and otherwise contribute to the increasing self-sufficiency of their own people.

In other words, these are investments and policies that are proven to pay off for the American taxpayer—no matter what happens.

I'll conclude with my third point: The progress we've made in recent years would not have been possible without development assistance from the United States. The progress we need to make in years to come won't be possible without it, either.

Whether we're talking about preventing the next epidemic or building upon the enormous global-health gains of the past two decades, the time to act is now.

As I've noted, this means increased investment from developing countries as they assume greater responsibility for their own health and development.

This also means the U.S. should at least maintain global-health investments at the fiscal year 2015 level—and, if possible, increase them.

Even though the progress we've seen is quite impressive, much remains to be done.

While child mortality is declining, it remains too high in too many places. Nearly 22 million children worldwide remain under-immunized each year, and more than 6 million die before the age of 5—with about 1.5 million of these deaths resulting from vaccine-preventable diseases like diarrhea and pneumonia. To address this, it is vital that the U.S. fully fund its recent Gavi pledge.

Despite some gains in maternal and child health, progress on newborn health has lagged, and far too many women still die in childbirth. Cost-effective and proven solutions are available to treat or prevent the causes of most newborn deaths.

These include such relatively simple and affordable measures as umbilical cord care; exclusive breastfeeding; and access to skilled birth attendants. Our ability to end these preventable deaths will depend on an even stronger commitment of U.S. funding for maternal and child-health programs.

Toward this end, we also need to ensure that women are fully supported in achieving healthy timing and spacing of pregnancies. U.S. investment in women's access to contraceptives and information not only contributes to better maternal, newborn, and child health—it also helps girls stay in school, and expands economic opportunities for women throughout their lives.

As I mentioned earlier, we may be on the threshold of a polio-free Africa—and of the eradication of polio itself. That's due in no small part to the initiative and generosity of the United States.

But this progress is hard-won, and the final eradication phase is the most difficult of all. But once we achieve eradication, we can turn those resources and that expertise toward other global-health challenges. Now is not the time to let up—we need to eradicate polio now, once and for all.

The Global Fund to Fight AIDS, Tuberculosis and Malaria is crucial to building health systems in poor countries. I urge you to maintain strong U.S. support for this highly effective organization.

Continued American leadership on the Global Fund now will set the pace for the upcoming 2017–2019 replenishment, and will help ensure strong support from other donors.

In addition, it is vital that the U.S. provide robust funding for PEPFAR and PMI—and maintain its current level of support for bilateral tuberculosis and neglected infectious disease programs. I am hopeful that new data will allow PEPFAR

to support recipient-country efforts to focus resources on areas of greatest need in the campaign against HIV.

It's also especially important that we eliminate malaria now in certain areas, such as the Mekong River delta of Southeast Asia, to prevent the spread of drug-resistant strains of the disease.

We need to bolster funding for research and development through the various USAID global-health budget lines. USAID plays an essential leadership role on R&D, in concert with other U.S. Government programs funded by the Labor-HHS bill—including through the National Institutes of Health; the Centers for Disease Control and Prevention; and the Food and Drug Administration.

The U.S. Government is also uniquely qualified to make vital investments in agricultural development. I urge continued strong support for the Feed the Future program—as well as for land-grant university research programs and the Millennium Challenge Corporation.

The Global Agriculture and Food Security Program has helped to ensure that developing countries have sound investment plans for agriculture—and that they put their own resources against those plans.

This program exemplifies a rising trend in global development and health: an emphasis on deriving leverage from the contributions of other donors—and from the domestic resources of the recipient nations themselves.

This makes development assistance an even better investment for the Congress, and for the American taxpayer. The need for such investment remains strong, and recent events demonstrate its urgency.

Thank you for inviting me to join you today. I look forward to your questions.

[CLERK'S NOTE: The 2015 Gates Annual Letter and articles from the New England Journal of Medicine and the New York Times are included as an appendix at the end of the hearing transcript.]

Senator GRAHAM. Thank you.

Mr. Affleck.

SUMMARY STATEMENT OF BEN AFFLECK

Mr. AFFLECK. Thank you very much. It is an honor to sit here in this room and speak before you great Senators. Thank you both very much for having me here. I am humbled by this esteemed panel. Thanks for having me follow the greatest and most important philanthropist in the history of the world.

I am sure I am going to come off great.

But, no, truly, it is an honor to sit next to Mr. Gates who has done such extraordinary things in technology and in philanthropy and I understand on your way in doing so in bridge.

Chairman Graham, Ranking Member Leahy, distinguished members of the subcommittee, I want to thank you deeply for inviting me to testify here today. My name is Ben Affleck. I am the founder of Eastern Congo Initiative. We are a grant-making and advocacy organization working with and for the people of the Democratic Republic of Congo.

I want to offer a special thanks to the chairman for holding today's hearings. Senator Graham, like others on the subcommittee, has proven time and time again to be a genuine champion for smart, effective U.S. foreign assistance. In August 2013, amid renewed violence in the region, Chairman Graham led a delegation to Eastern Congo, bringing five Senate colleagues along to see firsthand the potential of the region. This marked the largest ever delegation of U.S. Senators to visit this war-torn region. So thank you, Mr. Graham, for your confidence in the people of Congo and for learning more about what can be done.

And to Senator Leahy, I would be remiss if I did not acknowledge my co-star in Batman, roles marginally smaller than mine, but I understand you are quite good. Good morning, sir.

Members of the subcommittee, I am here today to offer a case study of the difference our Nation's foreign assistance and diplomacy is making, where small, targeted public and private investments are transforming communities in need, advancing our Nation's interests, and creating opportunities both in the countries we assist and here at home.

You have undoubtedly heard a bit about Congo, about its challenges and about the worst of its past: two decades of armed conflict; an estimated 5 million deaths due to violence, disease, and starvation; 2.7 million people who remain displaced today; and the appalling levels of sexual violence.

But these statistics tell you nothing about Congo's future or about the extraordinary and resilient people working every day to rebuild their nation.

Despite the many challenges, the Congolese people refuse to be defined by their country's past, and in spite of those who may question the effectiveness of our foreign assistance, I can tell you first-hand that U.S. diplomatic and financial investments in Congo are working.

U.S. foreign assistance accounts for only 1 percent of the entire Federal budget and vastly less than 1 percent of that 1 percent is allocated to the Democratic Republic of the Congo (DRC). Yet, from that fraction of a fraction, we are seeing important, powerful progress. Let me give you an example of what I mean.

In the late 1970's, Congo was one of coffee's leading exporters, but because of conflict and diseased crops, production today is less than 10 percent of what it once was. Congolese families lost a vital source of income, and the rest of us lost some of the world's greatest coffee.

Three years ago, Eastern Congo Initiative (ECI) saw an opportunity to revitalize Congo's coffee sector. In our work, we had met struggling rural farmers living on less than a few dollars a day. And we knew that with the right partners we could help give the skills and resources they needed to transform their communities. And we were thrilled that the United States Agency for International Development (USAID) agreed. Our Government made the bold decision to help us create a public-private partnership, together with ECI, the Howard G. Buffett Foundation, and the Catholic Relief Services.

Together in only 2 years, we have trained and supported 4,500 coffee farmers across four cooperatives to dramatically increase the quality and quantity of their crop and to help maximize farmer profits. We brought in global trade specialists to build an ethical supply chain that keeps money in the pockets of farmers and their families.

But what we have been able to achieve together does not end there. Prior to ECI's involvement, these coffee farmers had no access to financing, no line of credit. Imagine trying to start a business without any capital. You simply cannot, let alone in an emerging economy like Congo's.

So to close this gap, we brought in experts. We approached Scott Ford's company, Westrock Finance, which has worked alongside these cooperatives to dramatically scale their businesses in environmentally sustainable ways. I should add that Scott was part of that historic delegation with Mr. Graham that visited Congo in 2013.

The final puzzle piece was getting this coffee into American homes. So ECI brought in another investor, which was Starbucks. In the coming weeks, Starbucks officials will travel to the eastern region of Congo to begin a partnership with us to develop Congo as a key source of high-quality coffee. Starbucks has already purchased 40 tons. It may not be a lot for Starbucks, but it is a heck of a lot in eastern Congo, I assure you. It is the entirety of the cooperatives' very first export, representing millions of cups of coffee that will be sold in U.S. markets.

Involvement by the world's largest coffee company is a clear testament to what is possible for Congo. This is not charity or aid in the traditional sense. It is good business. From a relatively modest investment, farmers' incomes have more than tripled, and they can now afford to send their children to school, put food on the table, and access proper health care. As a result, the world has a new source of high-quality coffee.

This public-private partnership has transformed the lives of thousands of families in eastern Democratic Republic of the Congo (DRC), all made possible because USAID agreed that it could be done. But we think this is just the beginning of what is possible.

Next month, ECI will launch an economic development fund that is focused on expanding our existing work not only in coffee but in cocoa and other strategic crops. As a result of our new fund, we will work with at least 10,000 additional farmers over the next 4 years to build their business capacity, improve the quality and quantity of their products, and secure direct access to premium markets.

This work is scalable. This work is replicable. And in just 5 short years, it will have a transformative impact on nearly 100,000 individuals living in eastern Congo.

None of this would have happened without USAID, without their commitment—a relatively modest commitment, I might say—and without private sector partners willing to operate in one of the highest risk environments in the world.

With proper training and strategic investments, agriculture will become a driving force for Congo's economy, supporting the more than 60 percent of Congolese—that is 40 million people—whose families rely on agriculture as their primary source of income.

Simply put, we believe that a country with enough arable land to feed a third of the world's population should not struggle to feed its own people, to send its own kids to school, or afford basic health care.

Senators, this brings me to my final message. The next 2 years represent a critical turning point for DRC. With local elections scheduled for later this year and national elections in 2016, DRC enters an incredibly important window of opportunity for an unprecedented democratic transition.

Direct and consistent engagement by Secretary Kerry, the Special Envoy's office, and Ambassador Swan have helped Congo reach

this moment. As you know, your former colleague, Senator Feingold, served as Special Envoy until just a few weeks ago. His leadership and the 15 trips he made to DRC during his 18-month tenure was the very definition of direct and consistent diplomatic engagement, and we thank him for his service.

U.S. leadership played a vital role in the recent, yet fragile, progress toward peace and stability. To ensure this progress does not come undone, we urge you to join ECI and other groups like Open Society, Humanity United, Human Rights Watch, and the Enough Project in calling on the administration to appoint a new Special Envoy without delay.

Senators, if we continue to make smart and effective financial and diplomatic investments, we will help foster the next generation of Congolese entrepreneurs and leaders who will carry their country forward to stand as a model for the region and the continent.

Thank you, and I look forward to answering your questions.

[The statement follows:]

PREPARED STATEMENT OF BEN AFFLECK

Chairman Graham, Ranking Member Leahy, distinguished members of the subcommittee, thank you for the invitation to testify here today. My name is Ben Affleck and I am the founder of Eastern Congo Initiative, a grant-making and advocacy organization working with and for the people of the Democratic Republic of the Congo (DRC).

I want to offer a special thanks to the Chairman for holding today's hearing. Senator Graham, like others on this subcommittee, has proven time and again to be a genuine champion for smart, effective U.S. foreign assistance. In August 2013 amid renewed violence in the region, Chairman Graham led a delegation to eastern Congo, bringing five Senate colleagues along to see firsthand the potential of the region. This marked the largest ever delegation of U.S. Senators to visit this war torn region. Thank you Mr. Graham for your confidence in the people of Congo and for learning more about what can be done.

And to Senator Leahy, I would be remiss if I did not acknowledge the second biggest Batman fan in the room. Good morning, sir!

Members of the subcommittee, I am here today to offer a case study of the difference our Nation's foreign assistance and diplomacy is making—where smart, targeted public and private investments are transforming communities in need, advancing our Nation's interests and creating opportunities, both in the countries we assist and here at home.

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But these statistics tell you nothing about Congo's future, or about the extraordinary and resilient people working—everyday—to rebuild their nation.

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U.S. foreign assistance accounts for only 1 percent of the entire Federal budget, and vastly less than 1 percent of that 1 percent is allotted to DRC. Yet from that fraction of a fraction, we are seeing important progress.

Let me give you an example of what I mean.

In the late 1970s, Congo was one of Africa's leading coffee exporters. But because of conflict and diseased crops, production today is less than 10 percent of what it once was. Congolese families lost a vital source of income, and the rest of us lost some of the world's greatest coffee.

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But what we've been able to achieve together doesn't end there.

Prior to ECI's involvement, these coffee farmers had no access to financing, no line of credit. Imagine trying to start a small business without any capital. You simply can't, let alone in an emerging economy like DRC.

So to close this gap, we brought in the experts. We approached Scott Ford's company, Westrock Finance, which has worked alongside these cooperatives to dramatically scale their businesses in environmentally sustainable ways—I should add that Scott was part of that historic delegation with Mr. Graham that visited Congo in August 2013.

The final puzzle piece was getting this coffee into American homes, so ECI brought in another investor: Starbucks. In the coming weeks, Starbucks officials will travel to the eastern region of Congo to begin a partnership with us to develop Congo as a key source of high-quality coffee. Starbucks has already purchased 40 tons—the entirety of the cooperatives' very first export, representing millions of cups of coffee that will be sold in U.S. markets.

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This public-private partnership has transformed the lives of thousands of families in the eastern part of DRC, all made possible because USAID agreed it could be done. But we think this is just the beginning of what's possible.

Next month, ECI will launch an economic development fund focused on expanding our existing work not only in coffee, but in cocoa and other strategic crops. As a result of our new fund, we will work with at least 10,000 additional farmers over the next 4 years to build their business capacity, improve the quality and quantity of their products and secure direct access to premium markets.

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Direct and consistent engagement by Secretary Kerry, the Special Envoy's office and Ambassador Swan have helped Congo reach this moment. As you know, your former colleague Senator Feingold served as Special Envoy until just a few weeks ago. His leadership and the 15 trips he made to DRC during his 18-month tenure was the very definition of direct and consistent diplomatic engagement, and we thank him for his service.

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Senators, if we continue to make smart and effective financial and diplomatic investments, we will help foster the next generation of Congolese entrepreneurs and leaders who will carry their country forward, to stand as a model for the region and the continent.

Thank you and I look forward to answering your questions.

Senator GRAHAM. Jennifer and Violet are very proud. Very well done.

John.

SUMMARY STATEMENT OF JOHN MEGRUE

Mr. MEGRUE. Good morning and thank you, Chairman Graham and Ranking Member Leahy and members of the subcommittee, for allowing me to come today and talk to you about something that we all are, which we are all very passionate about, which is foreign aid. I have had a chance to get to know many of you on congressional delegations (CODEL's) and visiting hospitals and clinics around Africa, so I understand the kind of pushback you get here at home at times. But I thought I would share a business perspective on why I think foreign aid has been so effective and so important.

By way of introduction, I am a business person. I spent 30 years in private equity buying companies and owning companies and, with a team, trying to make them bigger, better, more efficient. But I am here because I have spent more than the last 10 years working in Africa on issues around health care, agriculture, education, and specifically the last 3 years, I started an organization called Born Free, which is fighting the transmission of HIV from mothers to children.

And in my philanthropy, I have followed three basic rules or criteria, if you will. One is that I work on things that are fast; two, that are doable; and three, that have great leadership that I can partner with.

And in mother-to-child transmission, just looking at each of those briefly—fast. The statistics around mother-to-child transmission led by the U.S. foreign aid are really astounding. In 2003, there were 600,000 babies born HIV-positive. Ninety percent of those died in the first 5 years of life. Last year, we were down to 200,000, so a 65 percent decrease in just over 10 years. This year, I think it will be less than 150,000, so a 75 percent decrease. These types of improvements are unheard of in global health. I know that we can eliminate mother-to-child transmission in the next few years.

Secondly, I mention that it is the things that are doable. Mother-to-child transmission is doable for two main reasons. One is that the science is very clear and it is proven, and secondly, that it is cheap. Having worked on other issues like education, agriculture, there are always significant debates about how to solve problems. But in the case of HIV, antiretroviral medicine is very clear, and it is now very cheap. And so when you invest your money, when others invest their money on the ground, we know what hits the ground effectively and without any debate about whether we are doing the right thing.

And the last thing I mentioned is great leadership, and my experience in business says that is probably the most important of the everything we go after. And I talk about leadership in three areas.

First, on the ground in Africa, we work very closely with government leaders, with health ministers, and community health care workers all over Africa. And of course, you do not get to the kind

of statistics that I just mentioned, those kinds of improvements, without those frontline people making it happen.

But also, and perhaps surprisingly, U.S. corporations. I work with many U.S. multinationals, including Chevron, General Electric, Johnson & Johnson, Estee Lauder, Mylan, MAC Cosmetics, and others who are all investing alongside the U.S. Government in this particular issue. And they are not just doing it because of corporate and social responsibility. They are doing it because it is good business. This is going to be the fastest growing market over the next two decades, and so they are committed to making these kinds of investments alongside the U.S. Government.

And last is the U.S. Government and the leadership that it is providing. I have worked closely with the leaders at USAID and at the President's Emergency Plan for AIDS Relief (PEPFAR). I know them well, and I can assure you they are doing a great job. They are making tough decisions to make sure that our money is spent efficiently. And for me as a philanthropist and for many others—I am sure the people at this table—knowing that that leadership is there keeps us inspired to be able to partner with the U.S. Government.

And I will share one final thought, and that is that we have a clear exit strategy in areas like this. This is not funding that is going to be required from the United States forever. Three years ago, I was co-hosting a CODEL. We were in Cape Town South Africa. We brought together some of the largest business people, philanthropists, the health minister for a lunch. And at the end of the lunch, one of the leading business people stood up and said two things. One, they said thank you to the U.S. Government, and secondly, they said how important our investment has been in South Africa getting over the hump and really starting to beat HIV and in particular mother-to-child transmission. They said, but we will not need your help forever. We will pick this up.

And so I came back. I looked up the statistics, and sure enough, in 2003, we were 100 percent of the HIV response. In 2008, we were 50 percent of the HIV response, and now we are down to about 25 percent of the HIV funding response. And we are seeing those stories around Africa where these countries feel an obligation to pick up these investments.

So I know with continued investment, that we will eliminate mother-to-child transmission. It will be one of the greatest accomplishments of this generation and I think an incredible accomplishment for the U.S. Government and our foreign aid to be the leader in that.

But I would say going into the budgets today, now is not the time to blink. This is not the time to slow down when you are really winning a battle like this, and I would like you to know there are people like myself and other panelists here that are there on the ground, very active, making sure that our money is well spent.

So thank you for giving me a chance to talk, and I look forward to answering any questions.

[The statement follows:]

PREPARED STATEMENT OF JOHN MEGRUE

Good morning and thank you Chairman Graham, Ranking Member Leahy, and members of the subcommittee for the opportunity to be with you here today on Capitol Hill to discuss these critical important issues. I am also honored to be part of this distinguished panel of witnesses. Because of America's unwavering, bi-partisan leadership, we are incredibly close to eliminating mother to child transmission (MTCT) of HIV/AIDS throughout the world. As an American, a humanitarian, and a financial investor, I strongly believe that we must sustain the cost-effective investments we have made in PEPFAR to achieve this important, and once unimaginable goal.

We have seen unprecedented progress in the fight against HIV/AIDS. We have gone from zero to nearly 10 million people on Antiretroviral Treatment (ARV) each year. We have saved more than 4 million lives, and prevented over 1 million HIV infections in children. Because of this progress, we have the historic opportunity to witness a generation born free of HIV. Momentum is building to reach this target. My organization, Born Free Africa (BFA), is committed to our goal of ending mother to child transmission by December 31, 2015.

My philanthropy has been guided by three simple business principles. I have chosen to invest my time, money, and resources in areas that meet three criteria: they need to be fast, doable, and have great leadership. It is with this private sector perspective, or this lens, that my views on our foreign aid investments are shaped. I can therefore comfortably speak on the effectiveness of our investment in the areas and these diseases where I work and about the efficiencies, the payback rates, the challenges, the return on investment, and scalability.

First is fast: the area where I focus, ensuring that babies are born HIV free, is one of the great success stories in global health history. Twelve years ago there were 600,000 HIV positive babies born per year. Four years ago the number was down to 440,000, down 25 percent. Last year it less than 200,000, down 65 percent, and this year I believe it will be well below 150,000, down 75 percent from its peak. The speed of success in dropping these numbers is unprecedented. I have no doubt that we can virtually eliminate mother to child transmission of HIV in the next few years.

Second is doable: the science is clear and the interventions are cheap. On many other critical issues like education reform, water and sanitation, agriculture, and energy, there are debates about the right way to solve the problem, or even about what the problem is to begin with. The science of antiretroviral medicine to fight HIV/AIDS is clear and proven. A pill costs less than 30 cents per day for a pregnant woman living with HIV to take during the prescribed period. Given this, my investment, and the investment by the U.S. Government, hits the ground with full effect, with no debate about science or methodology, and without overwhelming cost.

Third, and finally, great leadership: smart investments require sound leadership, and HIV programs in Africa are lucky to have strong leaders from all sides of the partnership. We rely on leaders in sub-Saharan African countries and Ministers of Health who are the core drivers of the success we are seeing in mother to child transmission. We also rely on leadership and funding that U.S. corporations provide. I work with U.S. companies including Chevron, Johnson & Johnson, Estee Lauder, Mylan, General Electric, and many others that invest both their time and money to fight these diseases. They are doing it not only because of an obligation to corporate social responsibility, and not only to improve local government relations. They invest in these issues because these countries are their fastest growing end markets. This is where they see their greatest growth coming from over the next two decades, and they know that investing in healthcare initiatives there will ensure that the markets are strong for the future and for their bottom lines. Lastly, and most importantly, we rely on leadership from the U.S. Government and its agencies, including PEPFAR and USAID. Both of these organizations have incredible leadership—teams who are adeptly refining their strategies, using data to drive their decisions, and making smart, forward-thinking judgment calls in the face of a changing landscape. These are exactly the kind of people we want running our investments. The U.S. Government is the largest bilateral funder of foreign assistance for health, we guide and influence the funding from the rest of the developed world, and we provide infrastructure and assistance far beyond our financial resources. As a businessman, a private philanthropist, and a co-funder of these issues, U.S. Government leadership has been critical to my interest and to our success.

Based on these principles, I started Born Free Africa because I realized that the private sector has a critical role to play in contributing to eliminating mother to child transmission of HIV. In 2001, over half a million children were infected with HIV, and 90 percent of these cases were transmitted from their mothers. When I

first heard these figures, I was floored. With simple, once daily treatment, 98 percent of children can be born HIV free. I decided to use my experience from the private sector to identify gaps in the response to MTCT and accelerate its elimination. And so BFA was launched.

BFA is a group of private sector leaders who lend our business acumen, skills, and resources to accelerate the pace towards a generation born HIV-free in the African countries most affected by this dreadful disease. BFA leverages our corporate experience to partner with African governments and business communities to recruit, develop and empower local management talent who then work within their own governments to amplify and expand the work of the partners, governments, donors and policy makers to eliminate mother to child transmission of HIV. Infusing business sensibility and injecting corporate talent into African Ministries of Health helps accelerate progress toward no child being born with HIV. Rather than duplicate or fragment, we seek to leverage on-going efforts. Our only agenda is contributing to elimination, and we work hard to fill gaps thereby maximizing the work of those around us, and having the greatest possible effect on outcomes.

Allow me to provide an example of how BFA operates. Nigeria accounts for over 25 percent of the number of children newly infected with HIV among the 21 high-burden countries that have been prioritized for MTCT programs. From 2007 to 2010, there was only a 2 percent annual decrease in the number of children newly infected with HIV. Given this, BFA decided to work with the Nigerian Government to accelerate progress. We created a core group of private funders who came together to pool their resources and invest catalytically in Nigeria's scale up of PMTCT and its journey toward elimination by leveraging small investments against Nigeria's more than \$500 million annual response to HIV.

Together, our partners, including Chevron, the MAC AIDS Fund, Johnson & Johnson, the Elton John AIDS Foundation, the Children's Investment Fund Foundation, and Mylan, all saw the value of investing in Nigeria and in collaborating to support a team within the Federal Ministry of Health to eliminate mother to child transmission of HIV. We support 12 local Nigerians who work within the Ministry of Health, where they act as behind the scenes advisors, doers, and leaders in support of the existing government teams. These individuals utilize best practices from the private sector, including data-driven planning and effective performance management, to promote the ongoing scale up of PMTCT services at the primary care level. After a renewed focus, increased attention, and smarter implementation, there has been a 10 percent decline in MTCT from 2010–2013. Additionally, in 2013, Nigeria tripled the number of clinics offering PMTCT services, and from 2013 to mid-2014, the country saw a 100 percent increase in coverage of pregnant women living with HIV initiating treatment.

Let me be clear that the progress we are all making simply would not be possible without PEPFAR, and the enormous and historic support of the United States Government and then American people. In my view, PEPFAR is the cornerstone of what the world has been able to achieve in the last decade. Put another way, PEPFAR spurned myriad partnerships among donor and endemic countries, and brought billions of dollars of new money to the fight. Sequestration with a flat cut to PEPFAR's budget would stop this progress in its tracks. We can deploy the best trained business minds, with the most committed and knowledgeable scientists, doctors and nurses, and the savviest technocrats, but without PEPFAR, and without your sustained leadership and the commitment, eliminating MTCT would be nothing more than a dream.

As an investor, I put my own money into BFA because I know that I can leverage the enormous investments made by the United States, and because I know it works. Like with any smart business investment, we have the data to prove it. In the last 5 years, there has been more than a 40 percent decrease in the number of new infections among children. But our work is not finished. In 2013, fewer than 200,000 children were infected with HIV passed down from their mothers. This remains unacceptable.

In an age of seemingly infinite disagrees, we can all agree that no child, anywhere, should be born with HIV. We have the tools and knowledge to block this transmission. The only thing stopping us is a lack of resources to ensure more access. We cannot back down from this fight now, not when we are so close to achieving elimination of one of HIV's most devastating byproducts. I am confident that with continued investment, eliminating mother to child transmission of HIV will be one of the greatest accomplishments of our generation.

Thank you, Mr. Chairman.

Senator GRAHAM. Thank you.
Admiral.

SUMMARY STATEMENT OF ADMIRAL JAMES STAVRIDIS

Mr. STAVRIDIS. Terrific to be with everybody this morning. I want to begin by thanking the Chairman and the Ranking Member for asking me to testify and waiving the height and the hair requirements, looking at my other vastly better looking colleagues here today.

I think the last time I saw Mr. Affleck was on the deck of an aircraft carrier in the Arabian Gulf, and he was out there doing a United Service Organization (USO) thing with Robin Williams, and I remember that day very well and thank you for coming out and seeing us and your support to our military, sir.

I am here because I am a member of the U.S. Global Leadership Advisory Council for National Security, and a group of about 160 senior retired military officers are part of that. And I wanted to kind of pick up where some of my colleagues have left off, which is to say from a military perspective how important this kind of work is. We have a very strong and capable military. Thank you to the Congress for that.

But we cannot create security in this 21st century simply with hard power. We need the tools of soft power which are what my co-panelists are talking about, and they are really diplomacy and development in a nutshell. And I would say, to summarize, we are very good at launching missiles today. We could improve at how we launch ideas. And diplomacy and development allow us to do that. So cutting this kind of work I think is a mistake at this time.

I will give you some practical examples. Senator Leahy and I, when I was the Commander of U.S. Southern Command before my time at NATO, worked together on Colombia. This is an area that, if you go back 15 years, looked a lot like Syria does today, a complete humanitarian disaster, millions of people displaced, high levels of violence. As Ben was describing in the Congo, it was an absolute disaster. We created something called Plan Colombia, which had a military component, but more importantly, it funded development and diplomacy, human rights, all of the soft power parts fitted together with the hard power. Today, Colombia is a nation that has not only improved vastly but is in a position to continue forward as an absolute linchpin strategically for the United States in the South American context.

In my time as a NATO Commander, I witnessed the same sort of effect in the Balkans. If we think back to the Balkans, 10 to 15 years ago, again it looked a lot like Syria does today, 8,000 men and boys killed in a single day at Srebrenica, extraordinary levels of violence, rape, torture. Yet, today in the Balkans, when they want to solve a dispute, they do not reach for a rifle. They reach for a telephone to call the European Union, to call the United States. Why? Because we were able to use some hard power but combine it with the soft power tools of diplomacy and development, which are the long game.

I will give you a third example and it is current. It is what we are doing today in Afghanistan where Senator Graham has served as a reservist coming on active duty in Afghanistan working on the judicial process there. This is soft power. Do we need hard power in Afghanistan? Absolutely, unfortunately. But the long game is di-

plomacy and development. You need both those things. When you bring hard and soft power together, you create smart power. That is what I would advocate for, and to try and do defense without diplomacy and development, I will simply repeat the quote that Senator Graham gave us earlier, as my very good friend, Jim Mattis, will tell you, if you scrimp on the development and the diplomacy, you are going to end up buying more ammunition. And as Secretary Gates, who was interagency before interagency was cool, would tell you, we cannot kill our way to victory in these situations. We need hard power, but we need these tools, development and diplomacy, as well.

I look forward to your questions, Senator.
[The statement follows:]

PREPARED STATEMENT OF ADMIRAL JAMES STAVRIDIS

Chairman Graham, Ranking Member Leahy, members of the subcommittee: I am delighted to join you today as we reflect on America's leadership role in the world, and the responsibility that leadership requires. This subcommittee, under your guidance, will determine the resources needed to protect our Nation and advance our values. Your decisions will help set the course for American security and prosperity.

Today, I want to salute this subcommittee and your leadership. You have been steadfast over these years of turmoil and threat in providing a steady hand at the wheel of U.S. foreign operations. More importantly, you have established a bipartisan atmosphere of respect and problem solving that is rare in this rancorous town, and should give some hope to the American people.

Mr. Chairman, I have come today to offer my military analysis, my firm belief that security, prosperity and peace are not simply an outgrowth of kinetic action and the tools of war. We need a balanced approach, what has been called a smart power model, which combines all the tools of statecraft, to include diplomacy and development, alongside defense. Moreover, we need to enhance our understanding in global affairs. As we say at The Fletcher School, we need to "know the world". Finding our way to a balance between hard power and soft power is smart power—the key to our security in this turbulent 21st century.

My message to you today is direct. Now is the time to double down on smart power.

I am part of a group of over 160 retired 3 and 4 star general officers who have planned for war, fought wars, and sought a path to peace. We know from hard experience, from command responsibility, that war alone, the military instrument alone, does not bring security. We all serve on the U.S. Global Leadership Coalition's National Security Advisory Council, which I co-chair, with my good friend, Marine General Tony Zinni. We support the USGLC, a broad based network of 400 businesses and non-governmental organizations (NGO's), national security and foreign policy experts, and business, faith based, and community leaders in all 50 states who support what I have referred to as a "smart power" approach of elevating development and diplomacy alongside defense in order to build a better, safer, world.

Mr. Chairman, I speak as part of the large coalition of military officers and veterans who embrace not just the notion of a balance between defense, diplomacy and development, but an enhancement, a new vigor in the concept of smart power that will help us meet the challenges ahead.

In my 37 years in military service to this great Nation, and now as the Dean at the Fletcher School of Law and Diplomacy at Tufts University, I have had the unique opportunity to see both the global battlefield and the global marketplace of ideas. There is no doubt in my military mind that we face new, unconventional security threats that will continue to test our ability to out-think our opponents and confront brutal ideologies.

But they are not the sum of my concerns. I also see serious threats to global health and economic prosperity. Narcotic trafficking and criminal gangs undercut democracy and development in Central and South America and their violence washes up on our shores as well, sadly accompanied by human trafficking and even human slavery. Extreme poverty still claims lives and dashes hope around the world. Indeed, the world is burdened by these assaults on dignity and justice. Civil wars and insurgencies, lawlessness and crime infect parts of Asia and Africa, the Pacific nations as well as the Atlantic. In sum the world is a dangerous place.

But danger comes with opportunity. I believe that over the long run we can turn peril into promise, but only if we meet the world's high expectations for our strength, wisdom and vision. We need to invest in our ability to exercise global leadership in a wide variety of ways.

For this Nation to excel, we need to understand the interplay of economics and development, politics and diplomacy, culture and business, surveillance and security. We need robust funding for what I consider the new strategic triad of United States national security—defense, diplomacy and development. There is no doubt in my mind that our strength, our own security, rests on congressional support for all the tools of American leadership.

The United States has a very strong and capable military. No one can match us on the sea, in the air, and in ground maneuver. While there will continue to be a need for that hard military power, Mr. Chairman, we simply cannot lead without using other tools as well. Competitor nations, competing ideas, challenge us with dark and repressive visions of life. But we must show the world, indeed reassure the world that:

- When disaster strikes, we are there
- When famine and disease threaten, we are there
- When there is a hope for diplomacy, we are there
- When people search for a better ideas and positive solutions on the global social networks, we are there.

We are very good at launching missiles—we must improve at launching ideas.

What is the price tag for a better, safer world? I would argue that the non-military aspects of our power bring a strong return on our investment, both in the public as well as the private sector. The funds we allocate to foreign aid, diplomatic security, humanitarian relief, education, and the many other international programs can save us from spending far more to put boots on the ground in troubled regions. It's exceptionally cost-effective.

By bolstering funding for our presence in the world, we reduce the burden on our men and women in uniform. As many senior military have said in one way or another, without funding diplomacy and development, you ensure that we will end up spending more on hard power.

The programs supported by this committee advance the values and interests of this country. I saw this day after day in every one of my senior military leadership assignments. I saw the value of public-private partnerships. The foundations and charities represented on this panel demonstrate unique commitment, compassion, and innovation. They strive to solve many of the world's enduring problems. They are on the ground, working hand in hand to improve lives. Whether it is in health, education, job creation, or local governance, these activities improve lives.

Their work and commitment is matched by the outstanding work done in our Nation's "headquarters" for diplomacy and development. These headquarters—centers of excellence, if you will—are key to U.S. security and prosperity.

The State Department, the Agency for International Development, the Millennium Challenge Corporation, Peace Corps, and many others, are national assets to achieve our foreign policy and national security goals.

The dedicated men and women in these agencies and departments, the NGO's working alongside these professionals, all comprise a great resource for our country. In the course of my career I relied on these experts constantly to provide economic development and effective diplomacy, whether in Southern Command implementing Plan Colombia to combat narcotics trafficking or as the Supreme Allied Commander of NATO in Afghanistan fighting against the Taliban.

These are steady and slow efforts, requiring patience and persistence. But there are results. Colombia, a nation once synonymous crime and violence is now experiencing an economic and tourism boom. Afghanistan experienced its first peaceful transfer of power, and new opportunities for economic development, especially in the mineral and natural resources area, are reducing dependence on poppy farming. There is no question that the civilian side of our international presence is crucial to our success. I honor the men and women civilians who live and serve overseas just as I honor those who serve in uniform. We share a commitment to this great country and a peaceful world.

The United States leads the world, not just in our military strength, but in the private sector, both business and NGO outreach. I support those programs where professionals can go back and forth between public and private activities, where those with a great depth of knowledge can contribute to the policy process and program development. There is an abiding value to experience, expertise, and steady involvement in a region or sector, in the military and diplomacy and development work. I hope those in public service in these areas can lengthen their tours in coun-

try, enhance their regional concentrations, to match the standards of commitment shown on today's panel.

I want to know that the expert on Bosnia or Afghanistan or Kenya has followed events there for years, remembers the head of state as a young professional, senses mood and political dynamics. As a military leader, I relied on our diplomatic experts who anticipated policy opportunities, who knew that the leader of the opposition worked with us a decade ago, and now is in a position to provide positive contributions. I want to know that a development project, tried years ago can now work better with micro financing or in partnership with the private sector. I value experience.

Under the outstanding leadership of Raj Shah, outgoing administrator of USAID, we are "bending the curve of development" to pull nations out of poverty, open opportunities, and search for local solutions matched by technology and innovation in healthcare, infant survival, agricultural production, and environmental protection. In this regard, we are reviving the idea of resilience, optimism, and problem solving.

These vibrant efforts can be seen in the Partnership for Growth program in El Salvador, Tanzania, Ghana, and the Philippines. Mr. Chairman, just last week, I saw an article noting the dramatic decline in corruption in the Philippines, reflecting both the development objectives of these programs with the technology of social media to crack down on corrosive corrupt business and government practices. This is resilience and problem solving. More importantly, as a country strengthens in its governance, as prosperity grows and stability takes root, America finds itself with new partners, new allies, in addressing global threats. I first saw the proven record of smart power in South Korea, a country which rose out of war torn poverty to a first world success. It was that combination of development assistance and strong diplomatic connection that turned a problem into promise. And this success enhanced American security.

Mr. Chairman, the programs funded by this subcommittee leverage American concern into American security.

I can attest to this connection personally. When I had to decide about military deployments in harm's way, I knew that in so many cases, the professionals at State, USAID and the NGO community "had our warriors' back" and supported our understanding of complex humanitarian crises. They cared for refugee and displaced children through three bone chilling Syrian winters. They connected aspiring computer scientists in Burma to U.S. high tech firms to speed an open society. They tended the sick, nourished the hungry, educated youth, and confronted injustice. These kinds of professionals are a gift to this Nation and we need to tap their knowledge and experience throughout the national security community.

On the diplomacy front, U.S. State Department experts represent our Nation bravely in over 180 nations around the world—often at high personal risk, as we have seen most recently following the horrific attack on Ambassador Mark Lippert in South Korea (a former member of this subcommittee's staff). Our diplomats are working tirelessly in the midst of high tension scenarios from Iran to Ukraine to East Asia. Strategic diplomacy and effective development can avert war, reconcile aggrieved groups, and alleviate humanitarian tragedy. As a military professional, I have always known that the use of hard power must be the last resort, and that effective diplomacy can help reduce the chances that we need to reach for the combat instrument.

But to be effective, we need a coordinated effort, between State and USAID, and all the other agencies of the U.S. Government engaged in the international world—Department of Justice, Homeland Security, Agriculture, Drug Enforcement Administration, on and on—all have a vital role to play.

My own experiences in Latin America as Commander of Southern Command, in the Balkans as the Commander of U.S. European Command, and in Afghanistan as the NATO Supreme Allied Commander all reflect the need for strong interagency and private-public partners.

Our approach must be international, interagency, and private-public—all undergirded by effective strategic communications. If we do that well, we achieve smart power.

Mr. Chairman, all of these efforts, our international, interagency, and private-public partnerships, are a vital investment for this Nation, an investment that must constantly be refreshed. The support this subcommittee provides is the seed money—the venture capital, if you will—for U.S. leadership in the world.

Mr. Chairman, just as we invest in technology or invention to achieve future wealth and advancement, we need to invest in these professionals and their programs, in diplomacy and development and other international, interagency, and private-public partnerships to achieve prosperity and security.

But these investments require political will and talking straight to the American people. Polls show that the American people have no idea how little this country actually allocates to International Affairs. In fact, they think we spend 20 to 25 times the amount we actually do—which leads to unfounded calls to cut these programs.

With a mere 1 percent of the entire U.S. Federal budget, the International Affairs Budget supports all of America's civilian tools of diplomacy and development.

Mr. Chairman, the United States is active around the world—in Europe, Asia, Latin America, the Caribbean, and Africa. No other country can compare. We set the standard for others to follow. Americans, in both public and private efforts, helped tackle Ebola, almost eradicated measles and polio, brought food and shelter after disaster, and brought encouragement to those searching for a way ahead. We have been leaders in all these areas—humanitarian, development and active diplomacy. Our diplomatic and development communities create the conditions for effective political and military coalitions. Because of our team approach, we have strong bilateral and multilateral ties which bring stability, peace and prosperity to the world.

Let me close by commenting on one region in particular which threatens this stability, prosperity and peace: the Middle East. And in this regard, I urge you, from my vantage point as a military commander and now as a dean in higher education that now is a time, as I said earlier, to double down on smart power. We need to bring the talent of this great nation, the development experts, the scholars, the diplomats together to enhance our understanding of this specific challenge. We shouldn't be scaling back funding. We need to scale up funding.

Our goal should be state-of-the-art diplomacy and development. To do this, we need to support smart research, smart new diplomatic and cultural initiatives, working with our allies, to confront the ideology of those drawn to the fight. We need a sophisticated grounding on this ideology, a world view so different than our own, so that our efforts, in diplomacy, development and defense, can be successful. We need hard power in the short term of course to face the spread of the Islamic State and support our allies. But we also need counterterrorist financing and effective intelligence. And for the long term, we need to support educational reform, intellectual development and opportunity. Combining hard and soft power over time: that is smart power.

Chairman Graham, Ranking Member Leahy, members of the subcommittee, these are serious times. We need to be creative and innovative, we need to be wise and knowledgeable. This Congress has the power to plot our course to continued global leadership by robustly funding diplomacy and development, and thus enabling smart power. I look forward to working with this committee in any way I can to support this vital effort.

Senator GRAHAM. We have Senator Boozman from Arkansas, and Scott is from Arkansas. So I think you may want to say something about our next witness.

Senator BOOZMAN. Well, very much so. And I apologize. After Scott testifies, I have got to run to a Veterans Affairs hearing talking about over-prescribing opioids. So there are all kinds of important things that are going on.

But I do want to thank all of you for being here. I am very familiar with the work that you have done. You are great examples of people that are using your time, your resources for those that simply have no constituency at all in the sense of representation.

Scott, it is a real honor to have you here. Scott is the guy that just felt called to jump out and do something for his fellow man and, as a result, through his efforts and hard work, I think has raised the gross domestic product (GDP) of Rwanda about 1 percent by giving them a worldwide ability to sell their coffee at the international market. So again, we appreciate your example, appreciate all you have done, as the other witnesses.

Thank you, Mr. Chairman.

Senator GRAHAM. Mr. Ford.

SUMMARY STATEMENT OF SCOTT FORD

Mr. FORD. Senator Graham, Senator Leahy, Senator Boozman from the great State of Arkansas, thank you very much. Nice to be here with you.

We could play a bit of a game here. One of these is not like the other. I am just from the private sector. I did not even know a lot of this was going on when I stumbled into the coffee business in Rwanda a few years ago, but I have learned the important powers of how the private sector and the public sector, even from the United States, can meet in places like East Africa and radically change people's lives. And I think that accrues to our collective—both continent's collective benefit.

I was the CEO of a company called Alltel Corporation until we sold it to Verizon in 2009.

I had been doing charity work in Rwanda for several years before that, and I had spent some time, considerable time, with the President of Rwanda, Paul Kagame. I discovered in some of those discussions that he and I—we are a bit of an outlier in this regard. We had a common philosophy around the role of the state and what it can and cannot do and the role of business and what it can and cannot do.

I will sum it up to say this. The crux of our conversations centered around a shared belief that the state, through its attendant bureaucracies, can from the top down bring safety and security, political freedom, even religious freedom. But it is materially limited in its inability to bring economic freedom. It is the final fruit of the tree, if you will. It is economic freedom that is actually only created in the private sector when people that have learned how to organize and manage a for-profit business, then mentor other people in that process.

Paradoxically, the group that benefits the most from a free market private enterprise system is not the richest of the rich. They are everywhere in the world. It is actually the poorest of the poor. President Kagame challenged me, if I ever got an opportunity to come back to Rwanda, to invest in the business that in his words said help the poorest of the poor taste the benefits of the free market system, he says, because once they do, they will not settle for a government that will not give it to them.

So I went back. Alltel sold in 2009, and I went back, frankly, not sure that I could find anything to do in Rwanda. But I thought, well, I will honor the request and I will go look and I will at least be able to report that I looked.

I got to Rwanda and I found out that there—I looked at a whole host of things too long to go through here, but I ran into the fact that 20 percent of the people in Rwanda make their income, their cash income, from the coffee business and that there were just two exporters that dominated the coffee trade. I then figured out that they were not paying the highest price for the coffee to the farmers that they could have and that there was room for a third party to come in and pay more to the farmers and still make a profit because I have to make a profit or I do not get to sustain the work.

So we started looking through how could we go into the coffee business. We really did not know much about it. We just bought

an old, abandoned, bankrupt mill at auction. We revitalized it and we hung a shingle out and we went into business. In the first 6 months of our operations, we saw the price that the farmers in Rwanda received increased 30 to 50 percent. That was the power of somebody just setting a reasonable price in terms of the cost of the product.

In addition, we have invested money on helping them to improve their yields, helping them to improve the quality. All of this translates directly into income. We were successful in Rwanda.

We expanded into Tanzania with Tembo Coffee Company. We then partnered with Falcon Coffees out of the United Kingdom and we finance and procure coffee from other parts of East Africa. I think we are one of the largest specialty exporters out of Uganda, Ethiopia, and now behind the leadership of the Eastern Congo Initiative and really closely right behind. It is kind of like going to—we had the United States ask us would you go to Congo. And I said not without Batman.

When Batman showed up, we went to eastern Congo, and we have actually been doing the logistics and financial support of his project as we try to get that coffee out to market.

I do not know what I was thinking, but we started a coffee roasting business. It is restaurantcoffee.com because I am running out of time. Thank you for the ability to make the plug.

Starting these businesses from scratch in this part of the world—my wife and my father stood with me, and everybody else said I was a madman. But we have seen \$100 million of incremental income go into the pockets of the Rwandan farmers from our being on the ground there over the last 6 years. That is a 50 percent increase in their standard of living. How do you impact 20 percent of the United States with a 50 percent increase in their standard of living? I do not know how to do it, and I could not have believed it was possible in just the private enterprise system.

But it was because we got there and there were groups that were funded by the U.S. Government and by philanthropists like Mr. Affleck and Mr. Gates, like TechnoServe, the Eastern Congo Initiative, the German Investment and Development Corp., all of these groups that are spending money to help the co-ops on the ground get their act together, get their accounting together, be able to function as a community under the rule of law. That is all supported by NGO's that are supported in turn by the U.S., and we have been building on that to translate the income differences into the Rwandan farmer.

I will say this as a final moment. I recognize in today's panel that we are just one company operating in a limited sphere of influence. I am good with that. But I hope that we serve as at least an example of what an American private sector actor can look like when we align with likeminded organizations. We can produce benefits that the poorest of the poor can literally taste. And I think that accrues to America's credit.

If you want to ask questions about that and how that ripples into policy and things, I would be glad to answer it. But it is an honor to be here today, and I appreciate the invitation.

[The statement follows:]

PREPARED STATEMENT OF SCOTT FORD

Chairman Graham, Senator Leahy, and members of the subcommittee, my name is Scott Ford and I thank you for this opportunity to share a brief history of Westrock Coffee's entrepreneurial activities in East Africa.

In 2004, after being involved in post-genocidal charity work for a few years, and while still CEO of Alltel Corporation, I took my three sons to visit Rwanda. While there, I had the opportunity to spend considerable time with President Paul Kagame. I discovered we were like-minded in our view that the free market system of open, competitive trade is the only system that offers sustainable economic hope—along with personal dignity—to those most deeply mired in poverty.

The crux of our conversation centered on our shared belief that the State—through its attendant bureaucracies and the rule of equally applied law, can, from the top down, ensure Safety and Security, Political Freedom, and even Religious Freedom—but that the State, beyond policy making, is relatively powerless to bring about true and lasting Economic Freedom. Prosperity, in other words, can only be created from the ground up, so to speak, by private individuals who, upon learning how to organize and operate a for-profit business, support and mentor others in that process. And paradoxically, the group that experiences the greatest relative benefit of genuine economic prosperity in a society is actually the poorest portion of the community.

In light of our common economic views, President Kagame asked me to join his Presidential Advisory Council and challenged me to someday return to Rwanda to invest in its future. Five years later, after Alltel was sold to Verizon, I returned to explore opportunities to follow through on his request to help build a company that would, in his words, “help the poorest of the poor taste the benefits of the free market system”.

After looking at several business opportunities, I settled on coffee exporting for a number of reasons but primarily because there were only two major market participants operating in the coffee export sector in Rwanda. It was clear; there was room for a third participant to make a reasonable profit while paying considerably more for coffee than was being offered to farmers at the time.

Rwanda, it turns out, was an anomaly in terms of typical coffee industry practices, but knowing nothing more about the coffee industry than that, we founded Rwanda Trading Company and purchased, at auction, a bankrupt, abandoned, coffee-processing export mill in the capital city of Kigali. Our intent was to make a profit and to attain enough market share that the other two exporters would have to increase the price they paid to farmers in order to stay competitive with us—thereby giving every farmer in the country—whether they sold to us or one of our competitors—an immediate and substantive raise! In our first 6 months, we saw the price paid to farmers rise between 30 percent and 50 percent compared to the established local market price.

In addition to impacting the price paid to farmers, we continue to invest to help them improve their yields and quality and make certain that our mill employees are paid and treated in a manner that is fair and honorable.

Based on the success of our coffee business in Rwanda, we expanded our export operations into southern Tanzania as Tembo Coffee Company and have partnered with Falcon Coffees in the United Kingdom to finance and procure similarly sourced coffees from other parts of East Africa including Uganda, Ethiopia, and most recently, behind the leadership of and in cooperation with the Eastern Congo Initiative, the Democratic Republic of Congo.

In order to directly connect East African coffee farmers with the American consumer, we started a coffee roasting operation in Little Rock, Arkansas, which roasts and packages coffee under the Westrock Coffee brand and is available through retailers such as Kroger, BI-LO/Winn-Dixie, Walmart, and online at westrockcoffee.com. We also offer coffee service to corporations, airlines, restaurants, and hotel chains.

Starting these businesses from scratch has been risky, but the impact our efforts have on the employees and farmers we work with is the reason we continue to expand. Last year, in Rwanda and Tanzania combined, we employed over 140 people full-time and 1,150 part-time and financed and procured coffee from over 60,000 individual coffee farmers.

Collectively, we estimate that the sum total of our coffee activities in Rwanda alone, over the past 6 years, put upwards of \$100 million directly into the pockets of small-holder coffee farmers, and our experience indicates this income most immediately goes to educational and nutritional advances for their children.

Additionally, where need and opportunity align, we build community water facilities and partner with governmental and social impact organizations like Heifer

International, the Eastern Congo Initiative, TechnoServe, the German Investment and Development Corporation, and others—many of which are partially funded by the United States Government and private citizens like Mr. Gates and Mr. Affleck. We also work with OPIC, through which we purchase political risk and investment insurance, and with fellow members of the private sector that help finance the tremendous working capital requirements of these ventures.

Senators, I appreciate your time and the invitation to share our story. I recognize that we are just one company operating in a limited sphere of influence, but I hope we serve as an example of how an American private sector participant—when aligned with like-minded organizations—can produce benefits that are, quite literally, tasted by “the poorest of the poor” around the globe—I hope and I believe, to America’s credit.

Thank You.

Senator GRAHAM. Thank you all. That was excellent.

So we will have that debate later on, and I will take some of your words to the Senate.

IMPACT OF SEQUESTRATION

Mr. Gates, you have been doing this quite a while in your private sector role. If the budget cuts are enacted that we are talking about under sequestration, scenario A, but if we actually adopted what is being proposed in the Senate today, a 50 percent reduction, how would that set us back from your point of view?

Mr. GATES. Well, I am very enthused about the progress that is being made. And so it would be a tragedy as we see how close we are on polio eradication that if we do not put out those resources now, that disease will spread back and the amount of money that you would have to invest to get back to where we are would be absolutely gigantic.

If you look at a disease like HIV, through the President’s Emergency Plan for AIDS Relief (PEPFAR) and Global Fund, millions of lives are being saved, and if you cut those programs back, there simply will not be enough medicine to keep people on treatment. The United States has been an incredible leader there, has done a great job of drawing other governments in. It is only through our generosity, though, that that other money is activated. So if we cut back, I think we will see other funds going away as well. Other governments, as a percentage of their economy, are often quite a bit more generous on foreign aid, and even so, because of the size of the economy, because of the technical expertise we bring, the U.S. finds itself in a leadership role that I do not think anyone would be able to step up to. So it would be a huge setback for childhood health, maternal health, disease eradication, all these things that we are devoting our lives to work on.

Senator GRAHAM. Thank you.

SECURITY ENVIRONMENTS

Mr. Affleck, you have been, I think, very involved in the security environment. All these development programs, whether it be private sector, whatever, you have to have enough security so that people from outside the region can come in and help. What is your evaluation of training the security forces as an American role? I mean, what benefit do we have not just on the hard side, soft side, but actually training indigenous forces? And how important is that to you in terms of your potential success?

Mr. AFFLECK. Well, I think one of the greatest issues facing the Democratic Republic of the Congo (DRC) now particularly in the east is the lack of a security sector. Not only that, but in fact there are times where the Congolese Army (FRDC) preys on the population itself, a sort of philosophy, a legacy handed down from the Mobutu days. We are not going to pay you. You guys live off the land, euphemistically. And this is an area that we are working in, but really this is a top-down area. It requires leverage from the United States and local regional actors to say—you know, include trying to end corruption, trying to get soldiers paid. And those are difficult things.

But one of the hardest things about that is to train soldiers properly, and we are uniquely suited to do that and we have been doing that. And the role of the United Nations Organization Stabilization Mission in the Democratic Republic of the Congo (MONUSCO), who has also been doing it, is somewhat controversial, but it is absolutely something that is required, particularly in light of what we are talking about, which is this sort of nascent public-private partnership building sustainable economic models where people are not just making a living but they are being set up. Their capacity is being built so that they can continue to make a living so that they can contribute to their society, so that you can see the ripple effect of this virtuous cycle. And that aspect of security is really important.

You have areas in the north where we are doing work with coffee collectives that are under threat from the Alliance of Democratic Forces for the Liberation of Congo (AFDL), which is an al-Shabaab-associated militia out of Uganda. When you have a state—and I am not saying anything new here—that in parts is failing, it is more vulnerable to that kind of extremism. When you have a state where people are more prosperous, they are able to resist that more effectively. In speaking to what the Admiral said, I am certainly no expert, but it makes sense to me when I hear folks like you and the Admiral say let us spend money this way before we spend money on bombs.

But this kind of training is something that we can do. It is relatively inexpensive, and we are the greatest in the world, without exception, at knowing how to build and train militaries.

Senator GRAHAM. So the reason I asked that question, for a small security investment, relatively small, not thousands of boots on the ground, but sort of in a mentor, training role, we can enhance everything you are trying to do in the private sector.

Mr. AFFLECK. Absolutely. You protect our ability to make those investments. You make people confident about making investments.

You know, what Scott is doing—he is being modest. He is essentially gap financing in places in the coffee industry where people just are not willing to do it. And that is the biggest impediment to business. And not only is he doing it, but he is getting his investors a legitimate return. He is making it capitalism and demonstrating that it is possible. In order to do that, you have got to have a window of safety. And that is one of the things that we are trying to expand in DRC and with a little bit of money, a little bit of investment from the United States, we can create enough safety that we

can encourage investment, public-private partnerships, the likes of which I talked about in my testimony.

Senator GRAHAM. Well, it is sort of a commercial for the United States Africa Command (AFRICOM) too. I mean, they do go together here.

IMPACT OF SEQUESTRATION ON HEALTH PROGRAMS

John, if we do the budget cuts under sequestration that is being proposed or adopt the amendment that is being proposed today, what does that do to all the success you have had in mother-to-child AIDS transmission?

Mr. MEGRUE. Well, not surprisingly, the leadership that the U.S. has and continues to provide is critical to the success. And many people follow us. The Department for International Development (DFID) from the UK, Germany, and most of the developed world have followed our lead on this. And so when we are making these kinds of investments in infrastructure, in medicine, in treatment and training, to pull the rug out to the magnitude of the kind of numbers that are being proposed today really brings it to a complete stop. It is not the kind of thing you can just meter back at these kinds of magnitudes that are being discussed. It halts it.

In a disease like HIV, what that does is instead of starting to in the case of mother-to-child, dropping it dramatically, in the case of HIV overall, which is now stabilized and starting to drop, you would see an explosion right away. So from my perspective and the team on the ground, we are really worried about that kind of move.

Senator GRAHAM. Admiral, I know you are not wearing the uniform today. Do you think it would be smart to take money out of this account and give it to the Department of Defense (DOD)? And do you think DOD really wants the money coming from this account?

Mr. STAVRIDIS. I think it would be a huge mistake. As I hope I have articulated, you have to put these tools together to create real affect in security.

SECURITY TRAINING

I want to underline the indigenous troop and training point that Ben was making in response to your comment, Mr. Chairman. And I will put a number on it. To sustain an American forward in combat in a place like Afghanistan or Iraq is about \$1 million a year for an enlisted troop. We can finance, train, and put effective Afghan troops, for example, in the field, as we do today, for literally pennies on the dollar compared to that. So the efficiency of this I think is very, very important to underline.

And I will also go back to what Mr. Gates and Mr. Megrue were saying, along with Mr. Affleck, which is the cost here is minimal. You leverage the private sector. And at the end of the day, our security is like an iceberg. The tiny tip of it that sticks up is the high-end capability. The mass of what we can create is frankly in the private sector.

So I think for those two reasons, taking money away from development and diplomacy and putting them into defense where we have strong levels of resources would be a significant mistake.

Senator GRAHAM. I am a little over my time, but I will ask one last question.

Scott, would it be possible for you to have done all of the transformation in terms of the coffee business and creating more disposable income without the Government infrastructure that exists today?

Mr. FORD. No. I mean, if you do not have that part of the apparatus in place, guys like me have nowhere to go.

Senator GRAHAM. Thank you.

Senator Leahy.

Senator LEAHY. Thank you, Mr. Chairman.

The chairman has mentioned that efforts that are going to be made to cut this budget even further. The House and Senate—the budget numbers were announced that those were cuts, certainly well below the fiscal year 2015. The House even more so, and they have talked about even beyond that.

I am thinking, Admiral—you mentioned the Colombia project. I do remember our time working on that. You may be interested in knowing I was at lunch with President Santos down there at one point, and he went out of his way to praise you and the project. So I mention that for whatever it is worth.

But let us assume that these cuts—we had level funding from last year. Of that, \$50 billion is—of that \$50 billion, a large part of it is used to run the State Department, our embassies, our consulates, pay our diplomats. A portion is used to fund ongoing programs we are committed to, treaty obligations like the United Nations.

ADDITIONAL RESOURCES

Let me ask this question of all of you, and let us say there was \$5 billion in there up for grabs. We spend it anyway you want. Any suggestions? Mr. Gates, you and I have talked about this many, many times in my office. Where would you spend it?

Mr. GATES. Well, there is an amazing number of NGO's that work on areas of agriculture, areas of health, and I am sure they would make a very strong case for any increase that would be available.

The basic health structure in Africa is very weak today, and as I said, that weakness means that if an epidemic shows up, we would not see it soon enough to go stop it and it would spread in the global economy very, very quickly, faster than the Spanish flu did back in 1918.

Senator LEAHY. In fact, you did an op-ed piece just a couple of days ago in the New York Times. You talked about that.

Mr. GATES. Right.

We are very much at risk unless the basic health and health surveillance systems in Africa get improved. The current budget lets us do that at a certain rate. If there were additional dollars, we would accelerate improving that basic infrastructure. And the beauty of that is that although it is an insurance policy to prevent an epidemic, which would come to these shores, it is also, year in and year out when there is not an epidemic, an amazing thing to lift people up and accelerate the time at which these countries will

be self-sufficient, both big contributors to the economy and able to educate their own people, and provide health services.

So health and agriculture are pretty basic things, and the formula for how you get better seeds out there, you get credit out there, and you build primary health care—a lot has been learned in a very sort of business-like way of looking at which countries have done it well and spreading best practices. That is so much stronger today than 10 years ago or 5 years ago that extra money could be used very, very effectively.

Senator LEAHY. Mr. Affleck, in the Congo—and I have read a number of the things you have said about it. There you have seen things that you thought might work and it did not. On the other hand, you have seen things that have pleasantly surprised you that worked. Suppose, using your experience, you were told, okay, we are going to make you the czar of that \$5 billion, how would you spend it?

Mr. AFFLECK. The first thing I would do is surrender that title.

Look, we financed a survey because one of the criticisms we got was, hey, you cannot work there. Hey, it is too dangerous. Hey, there is nobody on the ground. Our theory was we want to support community-based organizations. We want to show up and tell people what to do. I know I am the little guy on this panel. So I can speak for the little guy and the grassroots guy, which is to say that when we looked around, we saw a lot of grassroots organizations. These coffee and cocoa collectives are a perfect example of that. And we saw with our economic development fund alone, it is expandable and scalable. All across this part of the country, you have many, many, many NGO's, local Congolese-based NGO's, who are doing extraordinary work who are really wanting only for money. We can submit for the record the survey that we did, but it is definitively illustrative of it is not a question of where the money could go, but of need.

I will say that I take that your real point is around sequestration, around cutting the budget. And really, there are two ways to go. As I said, this is a very nascent process—these public-private partnerships, our ability to bring locals into this partnership and have them commit to it, have them believe in it. It is not like you have a line of people ready to sort of sign up to this exact way of doing things. And we ask them to change their practices and so on in order to create a virtuous cycle, in order to have a contagion of success. And that is what we have seen so far in just 2 or 3 years.

And I can tell you that taking away those checks, all of a sudden pulling the sheet out from under that will have the exact opposite effect. There will be a vicious cycle. People will say, well, you cannot work with them. Well, you cannot sit down with them. You cannot believe what Americans say. This kind of process is never going to work. We would rather revert to traditional aid where we sort of stand around and hope someone gives us a check.

Senator LEAHY. I do not want to put words in your mouth.

Mr. AFFLECK. You would not be the first.

Senator LEAHY. If that happened and you had to try to replicate it a few years from now, it is going to cost you a heck of a lot more. Is it not?

Mr. AFFLECK. All the costs that we spent would be gone, and then it would be twice as hard and twice as expensive to try to do it again, to rebuild the infrastructure, to re-gather the personnel, to try to reassemble what we had built and overcome a history of mistrust, a history of disappointment, and frankly people who had gone elsewhere, whether it is to do more or less agriculture somewhere else, or in the case of eastern Congo, having joined a militia, having gone to work in an illegal mine. There are a lot of other places that people could be working if they are told there is no longer a job for them farming cocoa or farming coffee.

Senator LEAHY. Thank you. My time is just about up. I do not know if any of the other three witnesses want to take a stab at this or all three, whatever you wish.

Mr. MEGRUE. Sure. I would just follow up on what Bill said. There are so many needs in Africa, but the area that I see the greatest leverage on our investment is investing in health care infrastructure and not in physical plant and equipment, but really in talent. The African health care systems are just sorely understaffed. And what we have seen is by providing what is essentially quite inexpensive talent to health ministers, health commissioners, around very specific issues, whether it is malaria, tuberculosis, HIV, et cetera, their rate of improvement is extraordinary. So in states like Rivers State in Nigeria where we have seen a 300 percent increase in 12 months of mothers on treatment or Bayelsa State where we have seen 160 percent increase, that is done by inserting some people that the health commissioners in that case can use to mobilize their people and train their people in the right way.

Senator LEAHY. Admiral.

Mr. STAVRIDIS. Senator, I would say very quickly I would take a significant chunk of it and do what you see in this panel, which is using State and AID that have the bureaucracies, leverage the private-public partnerships. And you see both at State and at AID small numbers of people who are expert at doing exactly that.

And then I have to give a shout out within this account for the Peace Corps which I think is incredibly underfunded and undervalued. Yet, every year at the Fletcher School where I am the Dean of the School of International Relations, our largest cohort walks in the door and they are Peace Corps volunteers. And I hear their stories, and I know their impact in the world. It is so wildly disproportionate to the tiny amount of resources they get.

Thank you.

Senator LEAHY. Mr. Ford.

Mr. FORD. You do not have to spend it all. You could put it to work in credit because credit is the lifeblood of commerce, and credit is what is dried up and missing. The U.S. banks have withdrawn completely from financing anything like what we do. The European banks which used to finance it have withdrawn completely. Our coffee business, all that we have talked about today, funded by individuals, happens to be from the State of Arkansas and the State of Texas who just care, and otherwise, it is the Chinese that have come in. So if you have got access to that kind of money, credit could use it too.

Senator LEAHY. You are preaching to the converted. Thank you for all that you do.

Senator GRAHAM. Amen.

Senator Daines.

Senator DAINES. Thank you, Mr. Chairman.

It is not often up here on Capitol Hill when you get to have an inspirational morning. But I want to thank you. I want to thank you each for your passion, your compassion, your generosity, your kindness, as well as your vision. And I am grateful for that that this morning.

TECHNOLOGY AND GLOBAL HEALTH

Mr. Gates, I heard rumors you had a background in technology. I have had great respect and watched what you have done for our country, as well as now for the world. Before I came on the Hill, I spent 28 years in the private sector as part of a cloud computing company we took public before—you know, people back then thought cloud was something to do with the weather, and we found it was something different than that.

But I would be curious around your thoughts of how you see technology affecting global health over the next 15 years. You have called that the big bet for the future.

Mr. GATES. Well, it is amazing how quickly these innovations that are initially designed to be used in rich countries—how quickly they can become very powerful tools in the poor countries that we are talking about. We are looking at using cell phones now to track the supply of medicines. It has been very difficult to run supply chains in these countries, and so often when you want malaria medicine or HIV medicine or reproductive health tools, they are just not available. So we are going in right now together with USAID and others and looking at this supply chain capability and saying we should know whenever there is a stock out. And as soon as you have that kind of information system, you are able to raise the reliability very, very dramatically.

A lot of the challenges in primary health care have to do with the workers showing up and the quality of their work, and by simply tracking their activity, having them take photos when they come in in the morning to show that they are there, taking a photo of what is in the clinic, that it is well maintained, we see a way to very efficiently improve the quality of the services delivered. And so this digital realm is giving us this unbelievable gift of patient tracking, supply tracking, labor quality.

And then, of course, over in the biological realm, the innovation there of creating new vaccines, new drugs, giving us the tools that will give us a chance to say that malaria, after we finish polio, will be the next disease that we will go after eradication.

So without that help of new technology, many of the goals that we have just would not be realistic. Because of breakthroughs, some funded by the National Institutes of Health (NIH), some funded by foundations like ours, most funded by the commercial sector where it is simply a reuse of the same cell phone or Internet technology, that is why we can be so optimistic about what a little bit of aid money could do to help these countries.

POLIO

Senator DAINES. Mr. Gates, you mentioned polio. As a Rotarian, I have been excited to be part of that effort, and what you all did there—we are very, very close now to eradicating polio in the world.

How can that story of the eradication of polio be a model for future success when we look at other public health issues that need to be tackled in order to bring parts of the world both out of poverty and into economic success and stability?

Mr. GATES. Well, polio has been an amazing campaign, and Rotary has been the lifeblood of keeping the energy there, even as it proved to be more difficult than was expected back in 1988. Today we have not had a case of polio in Africa for over 6 months. So the only two countries we have seen cases in in the last 6 months are Pakistan and Afghanistan. And even there where it is difficult, the government, the army, the NGO's are coming together. And so we are very optimistic that in the years ahead, we will see the end of polio.

There are a lot of lessons about how you orchestrate people, and it is a commitment of the polio eradication campaign that we will not just get rid of this disease, but we will leave behind far stronger health systems. For example, in the case of Nigeria, as we did polio eradication there, we saw that the basic structure of the way they budgeted, the way they managed the supply chain was not handled very well, and now through polio-funded initiatives, that is being put on a much, much stronger basis.

And so the success of polio will let us pick other diseases, including malaria, to go after with the confidence that we have learned how to do it.

Senator DAINES. Thanks, Mr. Gates.

PUBLIC-PRIVATE PARTNERSHIPS

Mr. Megrue, I was struck by your testimony as well as being a voice for the voiceless, these babies that are now being born HIV-free.

Regarding the public-private partnership that has been described—we will be discussing the funding issues today with a vote-a-rama on the floor of the United States Senate. And expanding our thinking even beyond the funding side of this, what other barriers do you see that we could work to remove or incentives to create to foster more of what you all are doing?

Mr. MEGRUE. I think there are two pieces of that. Of course, there is corporate investment and then private, philanthropic investment. I think the U.S. does have a chance to accelerate and sort of match funding ideas that they have experimented both with other governments, as well as with corporations and large foundations like Mr. Gates, because there is a big leverage point to have leadership like the Gates Foundation can provide to make sure not only—which he does with his investments but that he can do in a highly leveraged way with the U.S. Government's funding next to him. So we see that in many countries. We are working right now and moving into Kenya and Uganda and Angola and other places. But the U.S. Government's investment in time and energy there

has been central to creating the kind of dialogue that allows us to leverage what somebody like we can do.

Senator DAINES. Thank you.

Mr. Ford, given your background as well in the private sector and jumping into what you have done, any thoughts on that as well, other barriers that we could work to remove, incentives to create to foster what you are doing?

Mr. FORD. It is a bit of a stretch, but the U.S. banking system, from what I can see—I knew a lot of bankers. We did the largest leveraged buyout (LBO) that had ever been converted to a sale in the history of the U.S. in one check. I knew about every banker in the country. None of them would go with us to Africa, and they all pointed to the regulations facing them that caused them to say we do not know how to comply, and so we do not know what they are and we are withdrawing. And I had them tell me that face to face one after another after another.

How that factors into what we are talking about here today is not clear to me, but it is the reason we had to revert to gap funding by individuals for projects like this.

Senator DAINES. Thank you.

Senator GRAHAM. Senator Merkley.

Senator MERKLEY. Thank you, Mr. Chairman.

GAVI

Mr. Gates, thank you for the work of your foundation. And you started out your testimony talking about the Global Alliance for Vaccines and Immunization (GAVI), the vaccine initiative, and the basic numbers presented in your testimony I believe translate to about 25 bucks per vaccine and about 1,500 per life saved. I have heard the international vaccination effort described as the single most cost-effective way to influence global health. Is that a fair way to put it?

Mr. GATES. Yes, absolutely. There are two things we do by vaccinating children. One is that we save lives, and as you said, that comes down to less than a few thousand per life saved. But also for every life we save, there are about four children who would have grown up malnourished, that is, their brain and their body would not have fully developed. And if you look at the burden on the countries here, it is not just the level of deaths, it is the level of sickness so that even when those kids do get a chance to go to school or eventually participate in the economy, the fact that their health has been so poor completely holds them back. And so the vaccine investments would make the top of the list in terms of enabling them to support themselves.

Senator MERKLEY. So the U.S. contributed or pledged \$1 billion, including 2015, as you mentioned in your testimony. Was that the amount you hoped for, or should we have done more?

Mr. GATES. We were very pleased that the U.S. made an increase. In that case, every 5 years, that fund gets replenished. We are a big contributor to the fund. We got a lot of other countries to step up in a big way. Actually the UK is the single biggest contributor to that. We are the second. The U.S. Government would be third. So there is always room to do more, but we were pleased with the increase.

Senator MERKLEY. Thank you. That was diplomatic and well stated.

DRC

Mr. Affleck, you have been traveling to east Congo since 2007 I believe. How did you get engaged in the challenges of central Africa?

Mr. AFFLECK. I originally got—back then, there was a lot of activity going on around western Sudan, and I got asked to be part of that. And I really did not know a lot about it, and I did not want to be a dilettante. So I started doing a lot of reading and studying and meeting folks. And then I was shocked to see the degree to which, the scale of which the wars in central Africa and particularly in Congo, the great war of Africa, was dwarfing what was going on in Sudan, not to diminish that obviously. And I figured, A, if I had never heard of it and, B, if it was as big a tragedy as was being described, that ought to be a place I should get involved.

And so Whitney Williams and I started this organization, started traveling there, and we went around to about 11 countries around Congo and really just started looking at it and thinking without the sort of assumption that, well, I am a celebrity, I must be able to help, I thought, well, what can I do. What can be done? And ultimately we decided that we wanted to help foster a lot of these community-based groups that were not able to get money from the United States, that were not able to get the kind of capacity building because they were too small. And we wanted to be dexterous and we wanted to be nimble.

And really, once I had been to Congo a few times, there was no turning back. You see people suffering as much as these folks are suffering, fighting as hard as they are fighting. And I thought I would get there and find people just cowering and on the ground, and instead you find people going to the market, trying to get a job, trying to take care of their family in the midst of, as Senator Graham was there, grenades going off and all that stuff. Life flourishes and people try and people exhibit kindness and compassion and they want to take care of their families. And I was so moved by that spirit that I thought this is the place where I belong, and I want to try to do whatever I can.

Senator MERKLEY. Well, I want to celebrate the model of looking around the world and saying is there something that I can have an impact on for every American to think about because we are part of the global community and to take it as seriously as you have taken it and to look for real solutions.

You said in your testimony something that caught me a little off guard. I would have said “really?” and that was a country that could feed a third of the world. Could you expand on that a little?

Mr. AFFLECK. Yes. Well, it has just got a gigantic amount of arable land. It has got the world’s second biggest rainforest in the world. I mean, Congo is a massive country. A lot of it is under-populated. There are huge jungles, the hydroponics there could power all of southern Africa. And it is also extremely wealthy in copper, tin, tantalum, coltan, charcoal, lumber, gorillas. I mean, it has every conceivable natural resource. In fact, that may be one of the great tragedies of it. There were six or seven countries there during

the war trying to grab at what they could, diamonds. It has incredible potential.

And it suffered from King Leopold and the Belgians and Mobutu, down to the Rwandan genocide that sort of spilled over into Congo. So it has had a lot of bad luck, but it has got a tremendous amount of hope. And the people are great people.

And now is the time. You know, they are taking these steps into democracy, and they are occasionally taking to the streets to demand that the democratic changes are transparent. It is an exciting time, but it requires our engagement, our continued engagement, a new envoy, continued engagement from the Secretary to support these commitments that both folks in the private sector, and Raj Shah I know left a couple of weeks ago, whatever it was, but his commitment to USAID there and all over the world is important. And I think it is morally important that we maintain the continuity of those commitments.

Senator MERKLEY. Well, thank you for your hugely substantive engagement, and I am pleased that USAID has paid attention. I appreciate that Russ Feingold brought his expertise to bear from his Senate experience and the whole combination, many people coming together to make a difference.

An election is coming up in a few months?

Mr. AFFLECK. There are elections, but again, this is why it requires engagement. It is a little complicated. The president initially attached elections to a census, sort of got it through the lower house, and then once it went to the upper house, people objected to it. So he retracted. They are having this *de courtage*—my French is not great—which basically means they are going to carve up the existing provinces into fewer provinces, a process of decentralization, which is fundamentally popular in a country that big. However, people are suspicious that because they are not really ready for *de courtage*, it is a way of postponing presidential elections.

The long and the short of it is diplomacy does not cost a nickel, and we need to be engaged diplomatically. There is a lot of suspicion in many African countries of some of the former colonial powers. There is nothing but a lot of respect and admiration for the United States and our people, and we ought avail ourselves of that diplomatically.

Senator MERKLEY. It is tremendous. Thank you.

And my time is out, but for the balance of the panel, each of you are doing really important, valuable work. So often international aid is framed as, well, why should we be helping overseas when there are so many challenges here at home? And that is a question worth asking, but let us look at it also the other way. Given the gravity of issues around the world, should the U.S. as a leader in the world not be engaged? And does it not contribute to the relationships and the partnerships that help address world security issues as well? And you mentioned, Admiral, about the soft power side. So while we are doing really positive things for quality of life, we are also doing things that are valuable to the United States. Thank you for all of your work.

Senator GRAHAM. Senator Murphy.

Senator MURPHY. Thank you very much, Mr. Chairman.

Thank you. Your work really is truly inspirational and hopefully we will have, in part, a shaming affect on the United States Congress as we engage in a debate that will make your work harder.

SECURITY IN DRC

Mr. Affleck, I wanted to continue talking about the work that you have done. A few months ago, a story came out that the World Food Program had run out of money to serve Syrian refugees, the consequence of which was pretty clear. These were individuals who had no choice but to feed themselves and their family. And so if they were not getting that sustenance from a legitimate source like the World Food Program, then it was groups like ISIS itself where they were going to be forced to turn to for a paycheck and for a square meal for them and for their family. And so as we were battling ISIS, we were making decisions to underfund humanitarian resources that had the effect of driving people to the very organizations that we are trying to eliminate in the region.

And I imagine this plays out in the Congo where you have choices to be made. You have militias from the Lord's Resistance Army to M-23 that are offering help to these people in the form of small paychecks and sustenance, and if they do not have legitimate sources of income, I imagine that that just drives recruitment into a lot of these illegitimate sources and just creates more of the kind of problem that we are trying to solve.

So I would just love to hear you talk a little bit more about how this plays into the security dynamic inside Congo.

Mr. AFFLECK. In countries like this, you see a clear correlation between increased security and increased economic development, as you pointed out. It is really not debatable. And you know, like Hezbollah in southern Lebanon, when they step in and fill those roles, it creates problems. As I was talking about the Alliance of Democratic Forces for the Liberation of Congo (AFDL), they essentially are present in areas where our coffee manufacturers and our cocoa farmers rather are present.

Now, if this all goes away, if the funding is removed, if we are not there, it creates a very different environment. Either people have to flee or they have to join up with whether it is them or the Democratic Forces for the Liberation of Rwanda (FDLR), as you said, the M-23 or the many, many Mai Mai militias, oftentimes people are forced to join militias just to protect what meager things they have. And if they just have a job, if they just have a purpose, they will stick with it, frankly, under really, really difficult circumstances. And it is when people run out of options, that they either go work for slave labor in some mine and be exploited or engage in all the kinds of activity that we collectively understand as either abhorrent or virtually sort of slave labor. And it is really, really important that we support the civil society that is burgeoning in these countries and support the economic growth so that people have a place to go.

I think you make a very good point. And Congo, as it becomes better developed, will no doubt become more peaceful.

Senator MURPHY. Admiral Stavridis, one of the challenges that we have is figuring out who to fund. We have an interest in making sure that the money goes immediately to the best purposes,

which often means funding really well organized nonprofits, but in the end, we have an interest in good governance. And so there are reasons to run the money through local governmental institutions.

FUNDING MECHANISMS

I know the answer is different in each place, but as we look at some of the most dangerous places in the world, parts of Africa that we are talking about today or the Middle East, what is your recommendation and guidance as to the source of this funding?

Mr. STAVRIDIS. Thanks, Senator. I think you hit the nail on the head in that it is different in each of these different venues. But as a general proposition, using an agency like AID, Millennium Challenge, or State as a vetting kind of authority can be very helpful.

Secondly, depending on the individual state—and most recently, for example, Afghanistan. We have had a lot of controversy about whether this aid should flow through Kabul or go directly out into the field. There are even micro-climates, if you will, wherein you can be confident in Mazar-e-Sharif in the north, relatively confident in Herat in the west, but you ought to be a little more concerned as you get down toward Urozgan province or into Kandahar. So the point is there is no substitute for local knowledge, local expertise. You should kind of turn first I think in this case to the U.S. Government as a vetting authority.

And I want to close by saying I am very encouraged by some of the reforms that Raj Shah put in place at AID to improve the capability in this particular, very important aspect of things.

Thank you.

Senator MURPHY. I just want to close with a question to you, Mr. Gates. You are, obviously, a technology expert, as Senator Daines noted, but you also know something about marketing. And we are in a position today, as we have noted, where most Americans think we are spending about 23 percent of the budget on foreign aid. And the reality is even worse than it first appears. Yes, we are spending only 1 percent, but if you go back to the peak of foreign aid, the Marshall Plan, at that point, we were spending .3 percent of GDP on foreign aid, a program that I think everyone agrees has a good deal to do with the world order that we are living in today. We have got a 94 percent decline in foreign aid spending as a percentage of GDP since 1950. And yet, people still believe that it is a much bigger share of the budget than it is.

PUBLIC PERCEPTION OF FOREIGN AID

What is your quick recommendation as to how we change people's perception? What are the two or three most salient points from a marketing perspective to make people understand, to make our constituents understand that we have got to be dramatically increasing the share of the Federal budget or at least a portion of the Federal budget that we are spending on well-run programs?

Mr. GATES. As you say, most people grossly overestimate what portion of the budget is going to these things. And if you ask them, hey, what portion should go, they will say 2 or 3 percent, and of course, our response is, great, we would settle for that in a second. That would be a gigantic increase.

In terms of the share of budget or share of the economy, the U.S. is relatively low compared to other countries. In fact, the UK as an example raised their level up to be over three times what our level is at a time where they had very substantial deficits. And it was a decision that the relative impact of the aid dollars was very, very high.

It is unfortunate that the historic picture people have of aid is clouded somewhat by aid given during the Cold War where it was more about the bad guy or who was our friend than about the humanitarian impact. Today, the aid budget is not burdened by those things, and we are able to go in with the same business-like thinking that I applied at Microsoft and said, hey, is this money being spent the best way that it possibly could.

And the percentage of the USAID budget where our foundation is doing something in partnership with the U.S. Government is very, very high. So we get the analytic capabilities of USAID that are better today than ever, combined with ours and that of other people. And so there is a lot of learning that is going on in areas like agricultural and livestock. It is very exciting the new things. We are finding how to get new seeds out and how to raise the productivity and how to create self-sufficiency.

And so if people knew how small it was and how careful we are to make sure that there is impact, I think we would get strong support for the modest level that we are hoping to maintain.

Senator MURPHY. Thank you to all of you.

Thank you very much, Mr. Chairman.

Senator GRAHAM. Senator Moran.

Senator MORAN. Mr. Chairman, thank you very much.

Mr. Gates, nice to see you again. We have had a conversation for several years about eradication of polio in my role and capacity on the Labor, Health and Human Services, and Education, and Related Agencies Appropriations Subcommittee. It seems to me we are making significant progress. Thank you to your foundation for working so closely with Rotary International.

POLIO

But there have been outbreaks of polio in Kenya, as I understand, cases that are now being reported. How close are we and what more is it going to take to finally put this circumstance to an end?

Mr. GATES. Yes. The first half of 2014 was a concern because we had cases that had come up in Syria, cases that had come up in Somalia that spread to Ethiopia and Kenya. Fortunately, those outbreaks are now under control. And the country we thought would be the last, Nigeria, has not had a case since July 24th. And so if we are lucky and if we go another 6 months without finding a case, then we would be quite sure Africa may have seen its last case.

And so the focus now in Pakistan and Afghanistan is very intense, taking some of the same tactics that worked in Nigeria. And I would say we have a period of relative stability where the area up in the federally Administered Tribal Areas (FATA) that the Taliban controlled where kids were not being vaccinated—because the Pakistani army has gone in there, we now have access to

enough children that we can succeed in Pakistan. So we are very hopeful.

And the polio budget, which is a combination of some of the foreign assistance account and the Centers for Disease Control and Prevention (CDC) budget—that has made a huge difference. There was an increase there. CDC is an amazing organization, a great partner. I was down there, spent the day with Tom Frieden just a few weeks ago talking about Ebola and polio and how we work together. Very impressive. And the extra resources are making a difference.

Senator MORAN. Well, congratulations on your success and thank you for your commitment.

EBOLA VIRUS DISEASE

Let me ask just the panelists generally. What has been the consequence of the effort by the United States and the world community in regard to Ebola? What are lessons that are learned? What does it tell us that we ought to know to prevent circumstances such as this from occurring with this disease or any other medical health affliction? What can we learn from the world response to the arrival of Ebola in West Africa?

Mr. AFFLECK. That is you, Bill.

Senator MORAN. My press staff is going to be disappointed that I did not get an answer from Ben Affleck.

Mr. AFFLECK. Believe me, you made the right decision.

Mr. GATES. Well, all the things we do to build up stability, particularly what is called the primary health system that reaches out even to the poorest, most rural areas, when you do not have good primary health care, that means an epidemic can get started without the global awareness to go in there and intervene at the early stage. And because infectious diseases are exponentially explosive, the 6 months that we missed in Guinea because we did not know what was going on, that is what led to it being such a gigantic outbreak.

We are very lucky in this case that the agent was not more infectious. We are lucky that finally when it was recognized last August, that the world, particularly the United States CDC, has done a phenomenal job here. The U.S. military came in with the logistical capabilities that were lacking there. That was invaluable.

But we are likely to see sometime in the next 20 years a far worse pathogen than Ebola, and by having high-quality primary health care, good surveillance in Africa where it is very likely to emerge, we will be able to catch it at the early stage and not have it become like a 1918 Spanish flu. So it really underscores the investments we have made and the need to do even better on the surveillance front.

Mr. STAVRIDIS. May I comment on that, Senator?

Senator MORAN. Yes.

Mr. STAVRIDIS. I just want to pick up on what Mr. Gates said about the—there is a role I think for militaries here. This is a classic example of soft power. The militaries, in which we invest so much, have not only hard power warfighting capability but enormous logistics muscle, manpower, a capability directly impacting the medical field. So as a kind of “point of the spear” response to

get all of the real professionals in there, I think there is a role for the military.

I will add that speed is really the key particularly if a pandemic morphs the way that Mr. Gates is talking about. Think World War Z. There are examples not only in the real world but in fiction that would tell us we need to be ready for this. And I do want to just underline that.

Senator MORAN. I appreciate you indicating that because I think the initial response by many Americans when the idea of a military was going in to battle Ebola was that is not what we train military men and women for. That is not their mission. Why are they being called on to do that?

Mr. STAVRIDIS. A good way to think of that is an on and off switch. You know, life is not an on and off switch. In other words, we do not fund this magnificent military just to be in combat, on, or to sit in a barracks, be a ship tied at the pier, or an airplane that is on a runway somewhere, off. It is a rheostat between hard power, which we need at times, but also to bring this logistics, this expertise, this information, this intelligence to bear in a crisis like this at speed. We can dial that rheostat toward the soft power at that moment, and it is a very effective way, cost-effective way to use our military.

Senator MORAN. I appreciate that answer, and I would use this opportunity to thank Kansas Guard members who were called to duty in the fight against Ebola in Africa.

And, Mr. Gates, I would reiterate what you said about CDC. All Federal agencies are subject to criticism. I am a fan and supporter of Dr. Frieden and the efforts—Ebola and many other aspects of what CDC is doing, including prevention here in the United States and community health center.

Thank you very much to the panel for being here.

Senator GRAHAM. Senator Coons.

Senator COONS. Thank you, Chairman Graham, for calling this hearing, and I would like to just follow the line of questioning my good friend, Senator Moran, has been leading.

I had the opportunity to visit Liberia for the third time in December 2014 and to visit with our troops and missionaries, nurses, doctors, folks from the uniformed Public Health Service, many of the troops from the 101st, and to see the work they were doing on the ground. I also saw the impressive impact of the collaboration between significant private sector donors, between continent-wide organizations, and between grassroots community groups. I would like to explore two different points on that if I could.

EBOLA VIRUS DISEASE

First, Mr. Gates, as you referenced, we may well face a pathogen more lethal, more rapid in its spread than Ebola in the coming decades. In fact, it is likely we will.

We have made some significant progress in vaccines as well, developing both a field test for Ebola, and making progress in vaccines for Ebola brings some real hope about this particular episode hopefully coming to an end within the next few months.

In addition to the importance of having an African CDC for early warning, how do you see the path forward on vaccine development

and strengthening the capabilities for rapid characterization and rapid deployment of a vaccine in the face of a more lethal pathogen?

Mr. GATES. Well, it is amazing to how the little the world has prepared for a serious epidemic. The U.S. has done more than any other country, but even there we have not done enough. The Ebola vaccine—and there was actually an Ebola treatment called ZMapp—was partially ready, but the time it took, even using very unusual regulatory approval and trial processes, the time was too long for it likely to have any impact on this particular epidemic. And so our state of readiness was not as strong as it needs to be.

We do need to draw on other countries to also contribute to these efforts. We do need to take the various agencies of the U.S. Government who work on this and make sure that we have an overall strategy. One thing that I have called for is that we ought to do—in the same way we do war games to simulate challenges coming at us on the military front, that we ought to do germ games where we look and see how we would respond. The last time that was done in the United States, 2001, Dark Winter looked at a smallpox epidemic, and the resources proved inadequate in that case. So there is a good foundation. There is a lot of good science. NIH is the leader in many of these things. And so the idea that tools could be created quickly—that is a possibility, but we are not there yet to say that we are prepared.

Senator COONS. Well, I think there are important lessons for all of us to learn here, both about the strength of community health systems, the capabilities of community responders, and the huge cost we ended up having to invest and the significant loss of life that could have been avoided. I do hope we take your advice and work together in a responsible way to make sure we have those capabilities.

NATURAL RESOURCE EXPLOITATION

Let me talk next, if I could, about natural resource exploitation. As you know well, Ben, eastern Congo has been a victim of lots of different ways for illicit exploitation of natural resources. Wildlife trafficking has caused real crises in the Congo Basin and other places on the continent, as well as illegal mining and extractive misuses of natural resources. And we are increasingly focused in a bipartisan way in Congress in how that also helps fund and fuel extremism, and both transnational both criminal and terrorist organizations. So I would be interested, Mr. Affleck, to hear what you have seen in eastern Congo about this.

And, Admiral Stavridis, if you would talk about how this intersection between issues that are typically the concerns of conservationists and wildlife advocates have now really been put on the radar for national security issues.

Mr. AFFLECK. Well, first of all, Senator, I want to say thank you very much for all the work you have done. You are just one of these great unsung heroes on these issues—or maybe partly sung. I do not know how “sung” you are, but you are a hero.

Senator COONS. I sing off key, so not well sung.

Mr. AFFLECK. But thank you very much.

I can just speak to what I have seen and experienced, which is, as you point out, there are a tremendous amounts of resources there, you know, gold, tin, tantalum. It goes on and on. And almost all of them are dominated either by militia groups or by a sort of quasi-mafia military organization. Then really, that also has the same effect of empowering people who are not doing great things and have a pernicious effect on the country itself.

I talked about the Alliance of Democratic Forces (ADF) in the north. There is the Democratic Forces for the Liberation of Rwanda (FDLR), which is the former Armed Forces of Rwanda (ex-FAR), the people who committed the genocide essentially in Rwanda and the organization that they founded and maintained inside Congo, which they are now sort of taking on half-heartedly.

But, you know, what happens is when these industries are unregulated, they are controlled essentially by low level mobsters who then have allegiance to higher level organizations. And you have a country that has consistently been on the top 10 list of failed states. And so you have a security sector situation that is wide open to be exploited and manipulated.

I think there are two things to do. One is to try, as best we can, to help them regulate these industries, which is going to meet with a ton of resistance. And two is to try to really examine—look at these groups, see where the money is going, see what they do. One of them is an extremist Muslim group. Others are just as violent and hideous but subscribing to different religions. The truth is it is there. It is happening, and none of these extremist organizations, none of these militias survive, even though the cost of an AK-47 there is 40 bucks. None of them survive without these resources.

I do not know if you saw the movie *Virunga*, which is quite good, that park which is fighting for its life, quite literally. One of the things that is undermining them is there is a charcoal trade, which is illicit and makes a lot of money, things like timber that you would not expect. But all the resources that are there are being swallowed up by these illegal organizations who pay tariffs to the various powers that be. And it is one of the things bedeviling this country and preventing it from achieving real progress.

Senator COONS. Absolutely. Thank you for your leadership on combating this and making it better known.

Admiral Stavridis, how are we doing at bringing together our military expertise and resources and the fight against illicit wildlife trafficking, illegal mining, and how does that destabilize vital allies in the region?

Mr. STAVRIDIS. We focus insufficiently on this as a security problem. As Mr. Affleck correctly points out, it is the corruption and the financing that comes out of it that then undermines these fragile democracies, creates ungoverned space, and leads directly to security challenges which are global. And, of course, it is not just in the Congo. It is in Latin America and the Caribbean. It is in Afghanistan. It is in the Caucasus. It is very concerning. And we tend, as always, to look first to the hard power solution, but this is a case where many of the soft power things we are talking about, creating jobs, education, opportunity, you play the long game and you have a better chance of creating security.

I will close by saying another aspect of this is the routes that come out of it. So if you are moving natural resources that you have stolen or you are moving cocaine or opium, these routes create the opportunity to move weapons, extremists, and at the really dark end of the spectrum, weapons of mass destruction. So that is another shrimp on the barbie of concern I will throw out there.

Thank you.

Senator COONS. Mr. Chairman, would I be overstaying my welcome if I asked a last question?

Senator GRAHAM. Not at all.

MOBILE BANKING

Senator COONS. If I might, to anyone on the panel who chooses to respond, mobile telephone technology has transformed the possibilities of connection to the modern economy through mobile banking, real-time knowledge about everything from incidence of violence to grassroots political movements. Campaign incidents in Kenya, for example, were first documented using an open-source platform that Ushahidi built. Some real-time knowledge about the spread of Ebola and being able to do tracking was significantly facilitated through cell phones, which have now penetrated 70–80 percent of many of African countries.

How do you think we might partner with African nations to both unlock the potential of access to resources for the empowerment of small holder farmers and women's cooperatives through mobile banking? And how might we strengthen the ability of citizens to engage in the fight against corruption, against wildlife trafficking, against extremism through the platform of mobile communications? Any member of the panel who chooses to answer.

Mr. AFFLECK. Is this a technology question?

Senator COONS. Yes, sir. That does suggest a first answer.

Mr. GATES. It is very exciting what we are going to be able to do over the next decade. I would say we are just at the very start of that. In the case of Ebola, we were not able to track movements as well as we would have liked to. Having in place the ability to look at the data and make sure that we were not violating people's privacy—that was not set up. I think now that we have, in a delayed way, looked at that data, what we would have known better—that is a great impetus to move forward.

In terms of the Congo, the technology that is even more basic but is very critical is the satellite photography. The U.S. military, of course, has funded the creation of those technologies. Now, in civilian hands, people like Digital Globe are able to show us, knowing the population of DRC, knowing where the farming is taking place. We are doing a lot of funding people to do surveys like that because we have medicines for things like sleeping sickness, and figuring out where are the people and how do we get it out logistically, which is incredibly difficult in the DRC. It is only because of these digital satellite platforms and over time the increased penetration of cell phones. We think even in tough countries like that we will be able to get in and do great things.

As people are able to do digital transactions on the cell phones, things like remittances, getting back with lower fees, countries being able to understand their economy in a much better way, tak-

ing government payments that has always been inefficient and actually fairly corrupt before it gets out to the recipient that can be done to the woman's cell phone, that can make a huge difference.

So there is a ton of pilot programs involved in this. Many of them are involved in what you said, preventing corruption, by actually documenting what is going on when it goes on. If you ever have to go back and say, oh, did this seminar take place or what this payment made, the paperwork when it really did and the paperwork when it really did not, it is not easy to distinguish. But if you get photos taken while things are taking place, it is very possible to make it almost impossible for the money to go astray. So there is a lot of promise.

Senator COONS. Well, thank you. I appreciate the answer.

Mr. STAVRIDIS. Can I add? Just a practical example of what Mr. Gates just said is in Afghanistan where we pay 352,000 Afghan troops, but we have moved that to a mobile system. A, they do not have to go back to their village to take their tattered stack of currency, and B, it is documented. The corruption piece washes out.

And another technology that I think is interesting here is unmanned aerial vehicles, drones, which have a bad rep for a lot of reasons. But here is a place where they can be used very effectively to do the kinds of surveillance that Mr. Gates is talking about in Africa and in other areas to look at crops, to look at tracking, to look at who is trying to go after the black rhino, et cetera.

Thanks.

Senator COONS. I think there is huge potential for us to make a difference.

Mr. Chairman, I will allow Mr. Affleck a last—

Mr. AFFLECK. Just briefly, as Mr. Gates said earlier, existing cell phone technology is extremely potent from what I have seen. It is just a question of training and exploiting what is already there. And it makes a big difference. And one of the steps that we have seen in Congo that has been proposed and I think will be incredibly helpful is to use cell phones for banking ultimately so that if you are a soldier, the money actually gets to you because it is transferred directly to you. The way it works now is you make literally no money. I mean, you should see the FRDC's barracks. They are like tent cities. This is your national army? You know what I mean? Guys stealing pots and pans, and that is why you have these rapes and that is why you have this impunity. And this is not evil people. They want to be soldiers. They are put in this position. But if the pay did not have to go through seven officers who all took their cut and the guy before the soldiers who took the final cut, you would revolutionize the way that the armed forces work there, and they would go from being a really protective force to one that is a pernicious force. That is just one that I know of, but Mr. Gates said there are many, many more.

Senator COONS. Well, thank you. I would like to thank the whole panel for your contributions and for your testimony today.

Mr. Chairman, I want to specifically thank you for your real leadership over many years in making sure that our investments in foreign assistance contribute to our national security, and appreciate your calling this hearing today.

Senator GRAHAM. I thank the whole subcommittee. We have got a hard stop at noon, but Senator Blunt is here. So he will be our last inquisitor.

Senator BLUNT. Well, Chairman, thank you.

We had the Secretary of Labor at our hearing who was not nearly as popular as your panel, I am sure.

I will have some questions for the record.

Let me just say that for the work that this panel represents, the great private sector partnerships that are going on out there with what we do in areas like PEPFAR, the mother-to-child AIDS transmission successes are incredible. The ag research successes are incredible. What is happening in the Congo. And this really brings a level of attention to your leadership and the work we are doing here and also the importance of finding successes that we can talk about where we started a program, we worked with local partners, and at some point, we were able to walk away and leave that program with somebody else. It is the kind of thing that creates an understanding and an appreciation for the importance of what this subcommittee does. And the partnerships here are incredibly important in encouraging our role to make a difference around the world.

So, thank you, Chairman, and I will have some questions for the record.

Senator GRAHAM. Well, thank you, Senator Blunt. You have been on every trip I have ever put together. This is a great subcommittee, Republicans and Democrats.

Senator BLUNT. I would like that struck from the record, if you do not mind.

Senator GRAHAM. And we have gone to great places like the Congo, places I think most people appreciate you going because it means a lot to us.

In 2 hours, we are going to vote to cut this account in half. So this is a perfect day for you to be here. You made a compelling case. Scott, we need some financing we do not have today. I think I have learned a lot from the hearing. You have made a compelling case that we are inside the 10-yard line on a lot of these problems, mother-to-child AIDS transmission. The Congo may be turning a corner. Bill, polio. We got all this stuff on the run. And in 2 hours, the Congress, the Senate is going to have the chance to cut this account by 50 percent. Only in America. Only in Washington.

So in about 30 seconds apiece, tell me why that would be a good idea or a bad idea. Scott.

Mr. FORD. The footprint that America has in Africa, which is the only place I have got any direct experience, and the goodwill that we have inured there through the public and private sector engaging with the Rwandan leadership, with the Congolese leadership, and Uganda and Tanzania—to withdraw right before we win the game is to throw a pass when you are on the 1-yard line.

Mr. AFFLECK. I thought that was a good play.

Senator GRAHAM. I am sure you just made yourself a big hit in Seattle.

Admiral.

Mr. STAVRIDIS. I would say that we ought to look hard at what is efficient here, and the tiny cost of this account, as it is rep-

resented in the President's budget, is pennies on the dollar. It is like preventative medicine, which we have talked about a lot today. Do you want to spend money on massive treatment once the disease has taken place? That is hard power. Or would you rather have a program that is preventative, that looks at health on a day-to-day basis? That is soft power. It is much less expensive. You need both. There are times when you have to have hard power, but that balance between hard power and soft power, that is smart power. Let us be smart and not cut the development and diplomacy tools. They are absolutely necessary.

Thanks.

Mr. MEGRUE. Thank you, Senator.

One of the most basic business tenets that we learn early in our career is do not withdraw or blink when you are past the tipping point of success. And we are past the tipping point of success with this account in so many ways. We have heard today national security and others.

And Senator Murphy asked earlier, how do we explain this to the American public. And I think part of it is explaining some of these incredible successes, whether it is polio or what we have been able to accomplish in malaria or mother-to-child transmission or so many others. And I think it is getting that message out there that will cause people to step back and realize that making a cut like you are talking about or proposing a cut like you are talking about—this is the wrong time to do it. And that the local governments will be picking this funding up on their own, as they have been.

Mr. AFFLECK. I think it would be politics at its worst, as you said, Chairman, demagoguery, and really, truly shortsighted.

What I have seen personally are people who now have a job that did not used to have a job are moving into the marketplace. It is a model. Even more so than 10,000 farmers, you would be destroying a model in its earliest, most nascent phase, that is to say, business and investment is strong and powerful aid. It gives people a sense of self-confidence and a sense of meaning in their lives. And it brings goods to the market, the practice of which has built this country and has proved to be beneficial to producers, to consumers, and to the people who live in those communities.

And that model that is now starting to be practiced would be diminished, and that I think would be a real tragedy because ultimately that model is not only going to save the American taxpayer a lot of money, it is going to bring the American taxpayer—it is going to elevate the economy of the American taxpayer. It would be a crying shame because we are really on to something great.

Mr. GATES. Yes. I would go back to something Senator Graham said at the beginning, which is that the impact per dollar in this budget, particularly the health and the agriculture pieces that I know best, is probably more impactful than any money the U.S. Government spends. Yes, there should be a very high bar for spending money outside the United States in terms of the benefits to the people back here and to the impact that money has. But if you cut, say, \$3 billion from this budget, we are saving lives for \$1,500 per life saved and even better benefits for the survivors. So

that is over 2 million children a year that would die for lack of those resources.

Something like \$3 billion a year—and the cut being proposed is way larger than that—that matches all the money that our foundation spends in this area. We get a lot of visibility, but people should understand the U.S. Government, through its broad set of programs that we are partnered with, is about 10 times in its total foreign aid budget all the money we spend. And that is the basic underpinning of why we are seeing the great progress we are seeing on things like polio, and it is the foundation for making sure that a mass epidemic is caught at an early stage.

Mr. AFFLECK. Can I just say one more thing, Chairman, briefly? I think there is the sense that, well, if we do this, this is what we are doing, and these are not our priorities.

In our family, my wife does extraordinary work with early childhood education in the United States in the Appalachians in West Virginia, in Kentucky, and the central valley of California. It is something she cares deeply about, and she is extremely effective at it. And we are all very, very proud of her and impressed. I do work in the Congo.

We see that as a microcosm of what this Government can be. We can do both. We can do all of these things. We can apply our values to our relatives, to our neighbors, be they outside our national borders or be they within. I believe that is what America is.

Senator GRAHAM. Well, thank you all. It is probably the best hearing I have attended in a long time. Each of you in your own way represent the best of our country, and I think this account represents the best of America. And in 2 hours, we are going to go fight for it. Thank you.

SUBCOMMITTEE RECESS

The hearing is adjourned.

[Whereupon, at 11:58 a.m., Thursday, March 26, the subcommittee was recessed, to reconvene subject to the call of the Chair.]

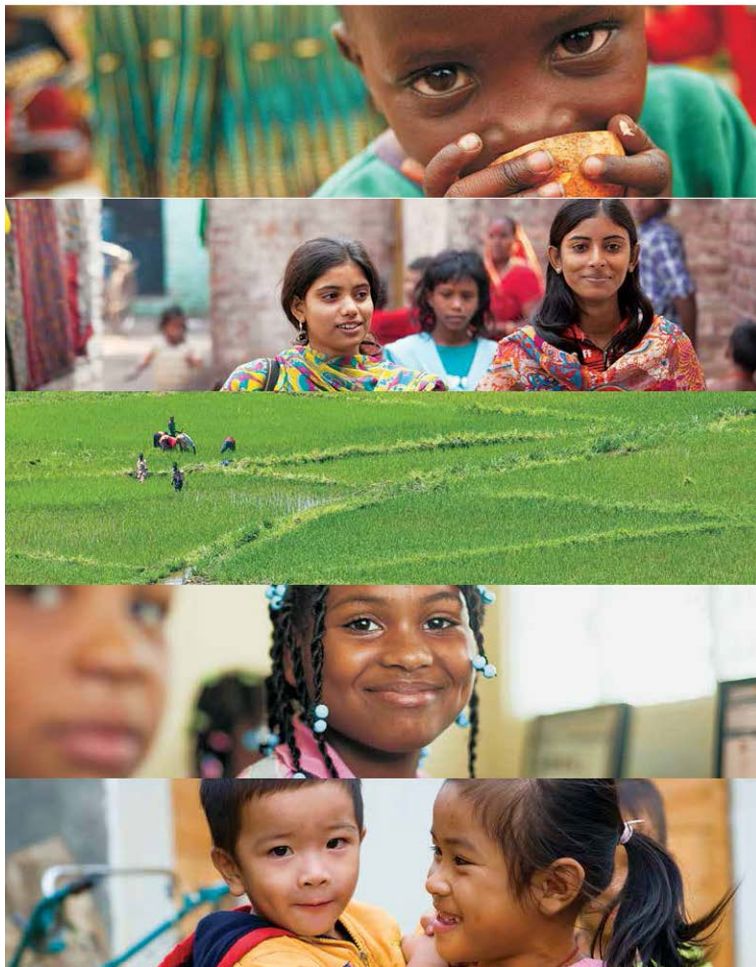
APPENDIX

[CLERK'S NOTE: The following material was submitted by Bill Gates and the Bill & Melinda Gates Foundation to be included in the hearing record.]

OUR BIG BET FOR THE FUTURE

2015 GATES ANNUAL LETTER

BILL & MELINDA
GATES foundation





OUR BIG BET FOR THE FUTURE

by Bill and Melinda Gates

Forty years ago, Bill and his childhood friend Paul Allen bet that software and personal computers would change the way people around the world worked and played. This bet wasn't exactly a wager. It was an opportunity to make computers personal and empower people through the magic of software. Some people thought they were nuts. But the bet turned out well.

Fifteen years ago, the two of us made a similar bet. We started our foundation in 2000 with the idea that by backing innovative work in health and education, we could help dramatically reduce inequity. The progress we've seen so far is very exciting—so exciting that we are doubling down on the bet we made 15 years ago, and picking ambitious goals for what's possible 15 years from now.

Our big bet: The lives of people in poor countries will improve faster in the next 15 years than at any other time in history. And their lives will improve more than anyone else's.

We see an opportunity and we want to make the most of it. We're putting our credibility, time, and money behind this bet—and asking others to join us—because we think there has never been a better time to accelerate progress and have a big impact around the world.

Some will say we're irrational to make this bet too. A skeptic would look at the world's problems and conclude that things are only getting worse. And we shouldn't lose sight of the fact that a handful of the worst-off countries will continue to struggle.

But we think the next 15 years will see major breakthroughs for most people in poor countries. They will be living longer and in better health. They will have unprecedented opportunities to get an education, eat nutritious food, and benefit from mobile banking. These breakthroughs will be driven by innovation in technology—ranging from new vaccines and harder crops to much cheaper smartphones and tablets—and by innovations that help deliver those things to more people.

The rich world will keep getting exciting new advances too, but the improvements in the lives of the poor will be far more fundamental—the basics of a healthy, productive life. It's great that more people in rich countries will be able to watch movies on super high-resolution screens. It's even better that more parents in poor countries will know their children aren't going to die.

It is fair to ask whether the progress we're predicting will be stifled by climate change. The most dramatic problems caused by climate change are more than 15 years away, but the long-term threat is so serious that the world needs to move much more aggressively—right now—to develop energy sources that are cheaper, can deliver on demand, and emit zero carbon dioxide. The next 15 years are a pivotal time when these energy sources need to be developed so they'll be ready to deploy before the effects of climate change become severe. Bill is investing time in this work personally (not through our foundation) and will continue to speak out about it.

We're excited to see how much better the world will be in 15 years. Here are some of the breakthroughs we see coming.

THE BREAKTHROUGHS



BREAKTHROUGH ONE
HEALTH

CHILD DEATHS WILL GO
DOWN BY HALF, AND
MORE DISEASES WILL
BE ERADICATED THAN
EVER BEFORE

P. 04



BREAKTHROUGH TWO
FARMING

AFRICA WILL BE ABLE
TO FEED ITSELF

P. 10



BREAKTHROUGH THREE
BANKING

MOBILE BANKING WILL
HELP THE POOR
RADICALLY TRANSFORM
THEIR LIVES

P. 16



BREAKTHROUGH FOUR
EDUCATION

BETTER SOFTWARE
WILL REVOLUTIONIZE
LEARNING

P. 20

**CHILD DEATHS WILL GO DOWN
BY HALF, AND MORE DISEASES
WILL BE ERADICATED THAN
EVER BEFORE**



Health workers, such as this woman in the Chandan slum, meet with mothers to discuss health concerns and family planning practices (Uttar Pradesh, India, 2014).

Until recently, the world was split in two.

In one half, virtually all children were vaccinated, had sufficient nutrition, and received proper treatment for common illnesses like diarrhea and pneumonia. The number of children in this half who died before they reached the age of 5 was well under 1 percent.

Then there was the other half.

Here, vaccination coverage was spotty at best, children tended to be malnourished, and standard childhood illnesses went untreated. About 10 percent of these children died before they turned 5; in some countries that percentage was much higher.

When we started our foundation, we were looking for the most strategic ways to help equalize the two halves of the world. We thought that if the world put a little more innovation behind saving the lives of poor children—for example, close to the same amount of innovation that goes into making computers faster and smaller—we could make a lot of progress.

When we look at the progress the world has made in the past generation, since 1990, we believe global health equity is an achievable goal. Increased investment in health care has led to better coverage with the vaccines and treatments that were already available, and intensified R&D has led to the development of new vaccines and treatments. The percentage of children who die before age 5 has been cut in half.

We predict that the next 15 years will see the pace of these developments increase even faster. The world is going to make unprecedented progress in global health.

Here are some achievements that are within the grasp of the “other” half of the world.

Cutting the number of children who die before age 5 in half again.

In 1990, one in 10 children in the world died before age 5. Today, it's one in 20. By 2030, that number will be one in 40. Almost all countries will include vaccines for diarrhea and pneumonia, two of the biggest killers of children, in their immunization programs. Better sanitation—through simple actions like handwashing as well as innovations like new toilets designed especially for poor places—will cut the spread of disease dramatically. And we're learning how to help more mothers adopt practices like proper breastfeeding and skin-to-skin contact with their babies that prevent newborns from dying in the first month after they're born. (Newborn deaths have gone down at a slower rate than deaths of older children and now account for almost half of all child deaths.) Many poor countries have built strong health care systems in the past 25 years, and in the next 15 years other countries will pick up on their ideas and provide more care—and higher quality care—for newborns and young children. Ultimately, this will mean millions of people alive and thriving who would have died.



The world is going to make unprecedented progress in global health.



BREAKTHROUGH ONE: HEALTH


Reducing the number of women who die in childbirth by two thirds.

In countries around the world, more and more mothers are giving birth in health care facilities instead of at home. Since 2005, for example, the proportion of mothers delivering at facilities in Rwanda has gone from 31 percent to 72 percent. In Cambodia, it has shot up from 20 percent to 57 percent. By continuing to make sure that the caregivers at those facilities are well-supplied and well-trained, we can take advantage of this global trend and make childbirth much safer for women around the world. In addition, maternal mortality will drop as more women get access to contraceptives and information about spacing their pregnancies safely. As that number goes up, the number of mothers dying will go down.



Polio vaccination campaigns like this one in Mashakeri village have helped rid Africa almost entirely of the disease [Kebbi state, Nigeria, 2011].

Left: Innovations to keep vaccines cold longer, without using energy, are making it more efficient for rural health outposts to immunize communities (*Achamo health post, Ethiopia, 2014*).

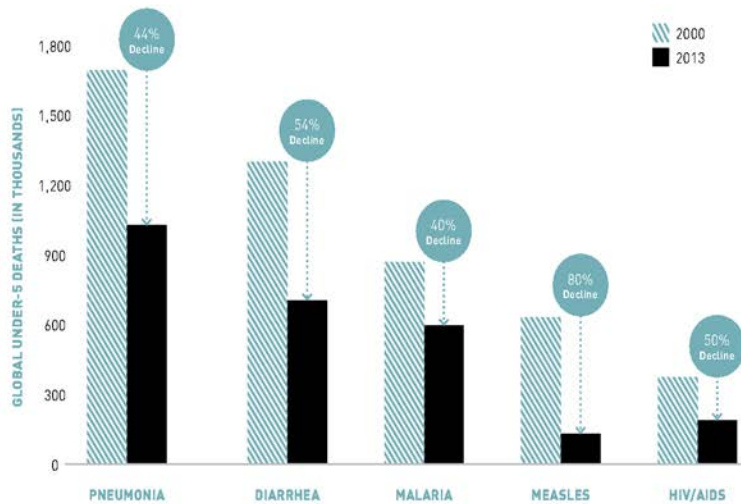
Right: When we meet with women's groups, they tell us what their communities need to thrive, such as safe, affordable sanitation (*New Dethi, India, 2014*).

Wiping polio and three other diseases off the face of the earth.

Destroying a disease utterly is a very difficult thing to do—so difficult, in fact, that it's happened only once in history, when smallpox was eradicated in 1980. But if we keep working hard, we can eradicate four diseases by 2030. We can get polio out of Africa this year and out of every country in the world in the next several years. Guinea worm, an incredibly painful disease whose sufferers spend months incapacitated while worms that can be several feet long burst out of their legs, will also be gone soon, thanks in large part to the leadership of President Jimmy Carter and the Carter Center. We'll also see the last of diseases like elephantiasis, river blindness, and blinding trachoma, which disable tens of millions of people in poor countries. The drugs that can stop these scourges are now being donated in huge numbers by pharmaceutical companies, and they're being used more strategically thanks to advances in digital maps that show where diseases are most prevalent. Last year these free medicines were distributed to 800 million people.

MORE CHILDREN ARE THRIVING

CHILD DEATHS FROM THESE LEADING INFECTIOUS DISEASES HAVE DECLINED SINCE 2000



Source: "Committing to Child Survival: A Promise Renewed – Progress Report 2014," UNICEF. Data sourced from the World Health Organization (WHO) and the Child Health Epidemiology Reference Group (CHERG).

BREAKTHROUGH ONE: HEALTH

Finding the secret to the destruction of malaria.

We won't be able to completely eradicate malaria by 2030, but we will have all the tools we need to do so. These will include a vaccine that prevents people with malaria from spreading it to the mosquitoes that bite them, a single-dose cure that clears the parasite completely out of people's bodies, and a diagnostic test that can reveal right away whether a person is infected. Early versions of all these tools are in development now. In 15 years, we'll be poised to send malaria the way of smallpox and polio.

Forcing HIV to a tipping point.

As we make progress toward a vaccine or a cure, the number of people beginning treatment in sub-Saharan Africa will finally outstrip the number of people newly infected. When we reach that point in the region with the most dense HIV transmission in the world, cases will start going down everywhere around the globe for the first time since the disease was discovered more than 30 years ago.

This [partial] list of breakthroughs gives a phenomenal picture of how much progress can be made in just 15 years. Life will get better, faster, because the number of innovations reaching the poor will be greater than ever before.

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Life will get better, faster, because the number of innovations reaching the poor will be greater than ever before.

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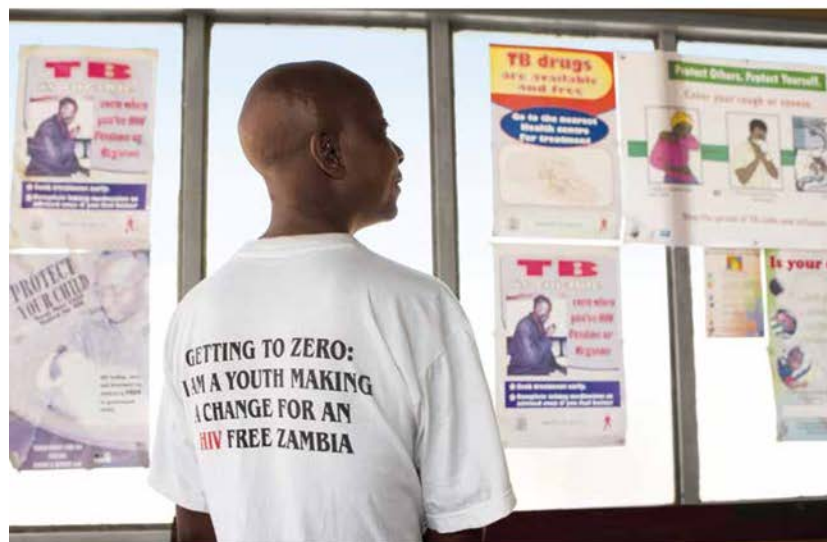


Photo by Tom Stoddart for the Bill & Melinda Gates Foundation/Reportage by Getty Images.

Clinics like Mother of Mercy Hospice help patients living with HIV/AIDS receive free antiretroviral drugs, information, and counseling [Chilanga, Zambia, 2013].



Mothers bring their children to health posts like Laura's Maternity Home & Clinic for vaccinations and health checks (Accra, Ghana, 2014).



Malaria screening programs and village malaria workers—in this case, Phnom Dambang village chief Long Vuthy—help patients like Hen Sros receive lifesaving treatment (Pailin, Cambodia, 2014).

BREAKTHROUGH TWO: FARMING

AFRICA WILL BE ABLE TO FEED ITSELF



Better seeds and innovative techniques are helping farmers like Raymond and Joyce Sandiya improve their crops (*Olerian, Tanzania, 2012*).

Every second Joyce Sandiya isn't tending her crops, she's volunteering at church, so when Melinda visited Tanzania in 2012, Joyce spoke to her with the zeal of a preacher giving a sermon. That year, for the first time, Joyce had planted a new kind of maize seed, bred to tolerate drought. When drought came, most of her crops withered and died, but her maize was more productive than ever. She sold the surplus to buy beans and vegetables and other nutritious food for her family, and had money left over to pay her children's school fees. "That seed," she said, "made the difference between hunger and prosperity."

Joyce's story, multiplied by hundreds of millions of African farmers like her, is the reason innovation in agriculture is so important.

Seven out of ten people living in sub-Saharan Africa are farmers. (Compare that to the United States, where the ratio is two out of a hundred.) And yet Africa has to rely on imports and food aid to feed itself. Though it's the poorest continent in the world, it spends about \$50 billion a year buying food from rich countries.

This is in part because African farmers get just a fraction of the yields that American farmers get. For example, the average maize

yield in Africa is about 30 bushels an acre. In the United States, it's more than five times that.

There's a related problem, which is that the food most Africans eat isn't nutritious or varied enough to make up a healthy diet. For example, many Africans consume starchy staples—maize, rice, or cassava—almost exclusively. As a result, malnutrition runs rampant across a continent of farmers, affecting children's cognitive and physical development and therefore everything from child mortality to how much they can learn in school to the productivity of laborers in the cities.

In the next 15 years, however, innovations in farming will erase these brutal ironies. The world has already developed better fertilizer, and crops that are more productive, nutritious, and drought- and disease-resistant; with access to these and other existing technologies, African farmers could theoretically double their yields. With greater productivity, farmers will also grow a greater variety of food, and they'll be able to sell their surpluses to supplement their family's diet with vegetables, eggs, milk, and meat. With the right investments, we can deliver innovation and information to enough farmers in Africa to increase productivity by 50 percent for the continent overall.

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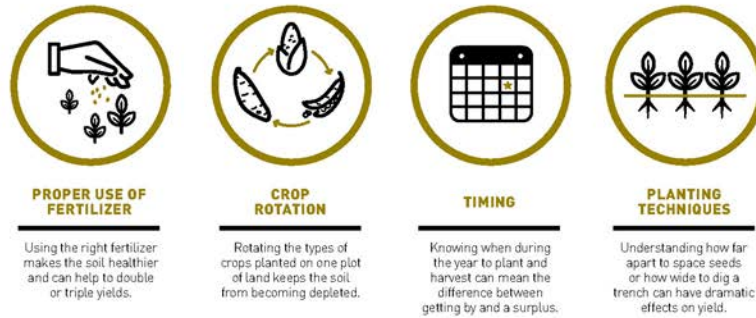
With the right investments, we can deliver innovation and information to enough farmers in Africa to increase productivity by 50 percent for the continent overall.

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BREAKTHROUGH TWO: FARMING

FOUR KEYS TO AGRICULTURAL PRODUCTIVITY

THE BENEFITS OF AGRICULTURAL EXTENSION



Source: Alliance for a Green Revolution in Africa (AGRA)

Agricultural extension, the process by which farmers get information—what seeds to plant, how to rotate crops to protect their soil, how to get the best prices at market—is complicated and expensive. Traditionally, it requires highly trained agricultural experts who know the local language and local crops in every region of vast countries. Agricultural extension also tends to be geared toward male farmers (for example, it may focus on the crops that men tend to grow), even though women do at least half of the farm labor in Africa. This is one reason women farmers are kept from being as productive as men, even when they have equal access to seeds and fertilizer. Investing in extension so that it helps more farmers in more places—women as well as men, smallholders as well as more commercial farmers—is the only way to reap the full benefit of innovation. One promising trend is that, as more farmers have access to mobile phones, they are able to receive all sorts of information—from weather reports to current market prices—via text messages.

We need to reach as many farmers as possible, because the challenges farmers face are growing more difficult. Population growth in Africa means they'll have 200 million more people to feed. And over time, climate change will make farming more difficult, with more

droughts and more floods. Bigger variations in the weather will mean both more bumper crops and more poor harvests—which makes raising productivity and improving food storage crucial. If farmers can grow and store more food, they'll be in a better position to ride out the lean years.

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We need to reach as many farmers as possible, because the challenges farmers face are growing more difficult.

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Agricultural extension services received via mobile phone help women farmers like Adasa John get larger yields of nutritious food (Morogoro, Tanzania, 2014).

There are other limitations besides productivity that keep Africa from feeding itself. The lack of infrastructure across the continent, for example, means that it's almost impossible to move food to the places it needs to go. (The most extreme case: The Democratic Republic of the Congo is the size of Western Europe, with a population of more than 60 million, but it has fewer than 2,000 miles of paved roads—the same amount as any middle-sized Western European town.) Trading within the region can be so difficult that it's often easier to fly food in from other continents than to drive it a couple hundred miles.

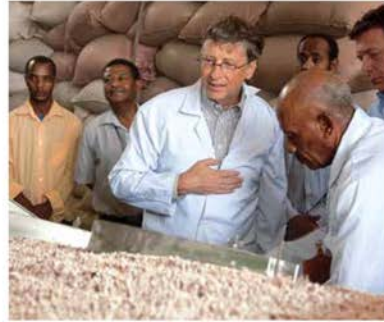


BREAKTHROUGH TWO: FARMING

But countries are building better roads. Ghana has recently cut travel time through its interior by two thirds, simply by widening the highway that connects its agricultural heartland to the airport and seaports. Countries like Senegal are removing the frequent checkpoints that make overland transportation so burdensome.

By growing more varied and nutritious food and getting it to the people who need it at the right time, Africa can achieve food security by 2030. It will still import food when it makes sense to do so, but it will also export much more, eventually achieving a net positive trade balance. Famine will strike less often—and when it does, it will be African countries that take care of the response.

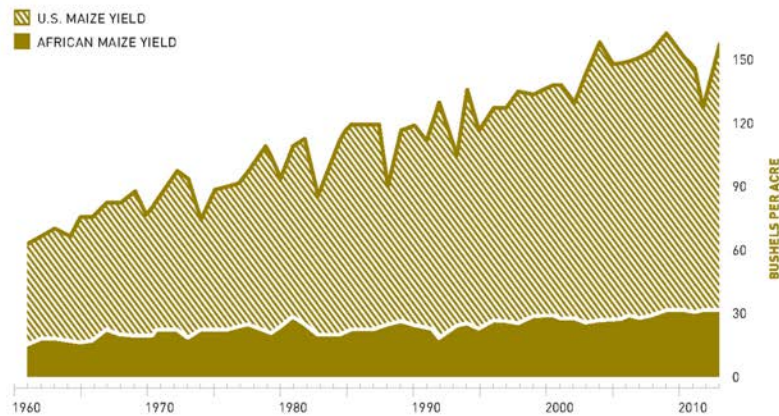
One of the current memes in development is "Africa Rising." Improving agriculture, the backbone of the African economy, can drive massive poverty reduction and improve life across the continent.



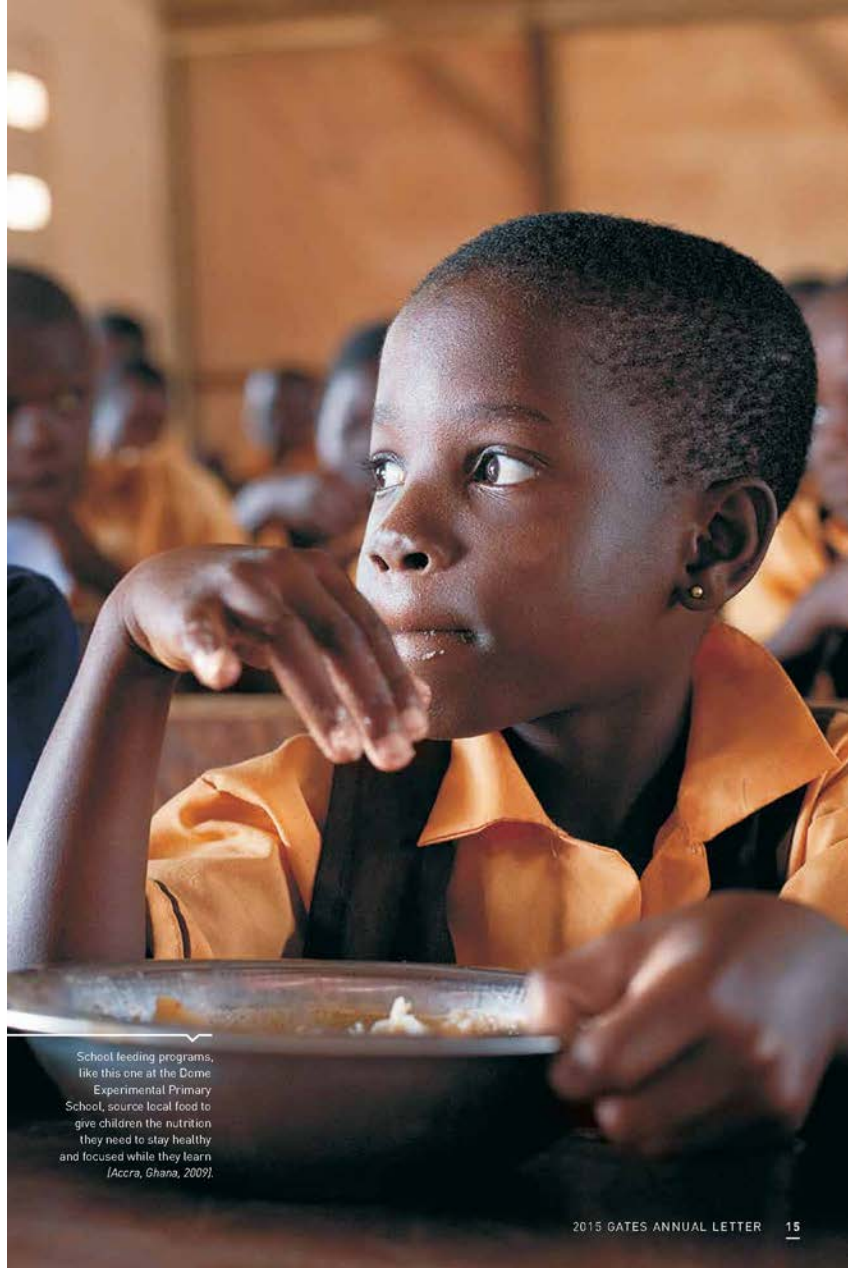
Research at an Acois processing facility is leading to improved legume seeds, which are then made available to the country's smallholder farmers (Adama, Ethiopia, 2012).

AFRICAN VS. U.S. MAIZE YIELD

AMERICAN FARMERS GET FIVE TIMES AS MUCH MAIZE FROM THEIR LAND AS AFRICAN FARMERS DO



Source: Food and Agriculture Organization of the United Nations (FAO)



School feeding programs, like this one at the Dome Experimental Primary School, source local food to give children the nutrition they need to stay healthy and focused while they learn [Accra, Ghana, 2009].

MOBILE BANKING WILL HELP THE POOR RADICALLY TRANSFORM THEIR LIVES



The financial lives of the poor are very complicated. The Kenya Financial Diaries, a fascinating project documenting the financial lives of hundreds of Kenyans over the course of a year, tells countless stories of people who had to forgo medical care or take their children out of school for want of a few dollars.

The reason poor people face these agonizing choices is not just that they don't have enough assets. They also don't have access to a bank to help them use their assets effectively. If their savings are in the form of jewelry or livestock, for example, they can't very well chip off tiny pieces to cover routine daily expenses.

Instead, the poor use financial services that are extremely inefficient. They save by hiding cash around the house or buying commodities that lose value over time. When they send money to friends and relatives to

help them through tough times, they either take a day off and deliver the cash themselves or trust someone else to do it for them. If they need to borrow money for an emergency, they have to pay usurious interest rates to a moneylender. Not having access to a range of cheap and easy financial services makes it much more difficult to be poor.

But in the next 15 years, digital banking will give the poor more control over their assets and help them transform their lives.

The key to this will be mobile phones. Already, in the developing countries with the right regulatory framework, people are storing money digitally on their phones and using them to make purchases, as if they were debit cards. By 2030, 2 billion people who don't have a bank account today will be storing money and making payments with their phones. And by then, mobile money providers will be

More and more people use mobile banking services such as SBI-Eko to deposit, save, and send money (Uttar Pradesh, India, 2010).

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By 2030, 2 billion people who don't have a bank account today will be storing money and making payments with their phones.

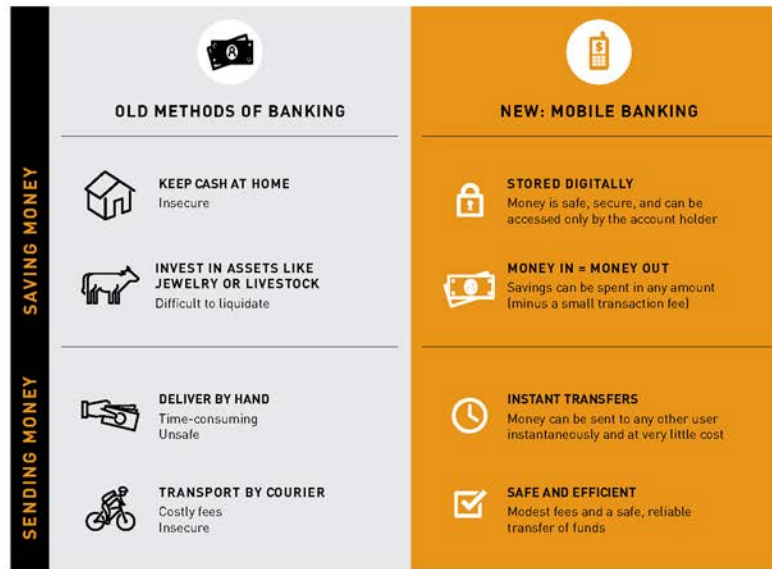
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Mobile banking agents like Mildred, who works for M-PESA, are helping customers transfer cash to digital currency and gain access to low-cost financial services (Eldoret, Kenya, 2009).

BREAKTHROUGH THREE: **BANKING****METHODS OF BANKING: OLD VS. NEW**

MOBILE PHONES CAN HELP PEOPLE MAKE THE MOST OF THEIR MONEY



offering the full range of financial services, from interest-bearing savings accounts to credit to insurance.

Traditional banks cannot afford to serve the poor because of their costs. That's why 2.5 billion adults don't currently have a bank account. In villages where people borrow or save in tiny denominations, building and maintaining a bank branch just doesn't make sense. And when most people think about financial services specifically for the poor, they think of microcredit, such as small loans to businesswomen in poor countries. Indeed, small loans have helped millions of people, but loans are only one of the financial services the poor need, interest rates are relatively high, and these services have reached only a small fraction of the poorest.

The companies pioneering mobile banking find it profitable to serve the poor because the marginal

cost of processing a digital transaction is near zero. And because so many people in developing countries have mobile phones—more than 70 percent of adults in many countries are subscribers now—the volume of transactions can be very high. By making small commissions on millions and millions of transactions, mobile money providers can make a profit serving poor customers, just as brick-and-mortar banks do serving the wealthy. Once these services get going, there will be competitive innovation in offerings like special savings or credit plans related to farming or education.

In Bangladesh, the fastest-growing financial services company is a mobile money provider called bKash. Less than four years after launching, it processes roughly 2 million transactions per day, with a total value of nearly \$1 billion each month.

This vision of the future isn't going to materialize by itself. There are barriers that people in the field are working hard to solve. Mobile phone access, for example, still isn't equal; only 46 percent of Bangladeshi women own a phone, compared to 76 percent of Bangladeshi men, which means women lack access to services like bKash and the opportunities that the digital economy is bringing to Bangladeshi society.

There is a lot of work ahead to get regulators in developing countries to update their financial regulations. If the regulations limit digital banking, as is still the case in most countries, innovators can't enter.

Another key factor to getting the use of digital money to critical mass is making sure there are enough locations where people can convert digital money into cash and cash into digital money. Without this as an enabling factor, the digital economy can't get started. Making sure that enough retail stores in every community provide this service allows the digital economy to bootstrap into the mainstream.

One interesting feature of digital financial innovation is that some of it is happening in poor countries first. If we waited a few decades, banks in developed countries would invent digital banking tools, and they would trickle down eventually to developing countries. But because there is strong demand for banking among the poor, and because the poor can in fact be a profitable customer base, entrepreneurs in developing countries are doing exciting work—some of which will “trickle up” to developed countries over time.

Bangladeshi customers gain access to a growing digital economy through bKash's community-based financial services (Dhaka, Bangladesh, 2014).



Photo courtesy of bKash Ltd.

BETTER SOFTWARE WILL REVOLUTIONIZE LEARNING



College students like Shawn Lee benefit from online courses that help balance schoolwork, jobs, and a family (*Steamboat, AZ, 2014*).

Last fall, Bill met a number of students in Arizona who are getting their college degrees through online schools. One of them, Shawn Lee, is a former construction worker who went back to college so he could build a better life for his young son. Shawn told Bill how he had struggled in a traditional school—and how learning online made it much easier to balance school and work.

Yet if we went to a poor country and asked a street vendor about taking online classes, she would just laugh. The idea would seem ridiculous.

It shouldn't. And one day, it won't.

Our foundation gives more money to education than to any other cause in the United States because it's the best lever we've seen for giving every child in America a chance to make the most of their lives. Some of the work we fund is focused solely on

U.S. students and teachers. But a core piece of it—online courses—will be a global asset, available to anyone with a smartphone or tablet.

As high-speed cell networks grow and smartphones become as cheap as today's voice-only phones, online education will flourish. For people in rich countries, it will be an important step forward. For the rest of the world, especially in places where growth is creating demand for educated workers, it will be a revolution.

Think back 15 years, to when online education was first gaining traction. It amounted to little more than pointing a camera at a university lecturer and hitting the "record" button. Students couldn't take online quizzes or connect with each other. It wasn't interactive at all.



Students in rural communities have access to more educational resources than ever, thanks to teachers empowered by tablet devices (*Nairobi, Kenya, 2013*).

Photo courtesy of Frederic Courbet for National Public Radio (NPR)/Bridge International Academies.

BREAKTHROUGH FOUR: EDUCATION

The technology has already come a long way, as you can see at sites like Khan Academy, and it will advance even more in the next 15 years. Before a child even starts primary school, she will be able to use her mom's smartphone to learn her numbers and letters, giving her a big head start. Software will be able to see when she's having trouble with the material and adjust for her pace. She will collaborate with teachers and other students in a much richer way. If she is learning a language, she'll be able to speak out loud and the software will give her feedback on her pronunciation. (Some sites do this today, but the technology will improve a lot.)

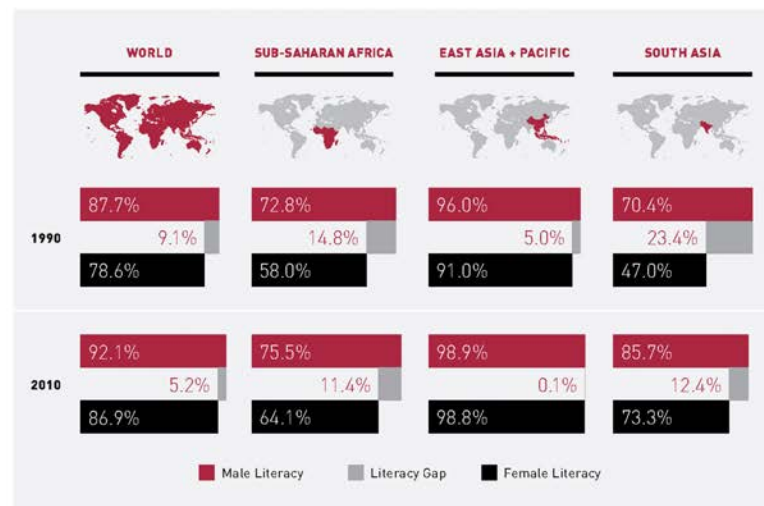
Many of today's online classes are disconnected from career paths, but that will change too. Suppose you want

to be a health worker; you'll be able to find out what level of math, chemistry, and other subjects you need to meet the requirements, and you'll be able to do much of the work online. Some content will need to be localized for different places and languages. Yet the basic ideas don't change; algebra works the same way everywhere.

There is one thing software will never do: replace teachers. Even the most self-motivated student needs guidance and support. But software can play a crucial role, for example by connecting teachers to each other. They will be able to upload videos of themselves and get advice from their peers, watch the best teachers in the world at work, and get real-time feedback from their students. These advances will be important in the

CLOSING THE GLOBAL LITERACY GAP

EQUAL ACCESS TO EDUCATION AND TECHNOLOGY WILL EMPOWER MORE WOMEN AND GIRLS TO BUILD BETTER LIVES



Source: The World Bank



Melinda and our daughter Jennifer spent several days with a farming family and learned about the challenges girls face getting an education (Tanzania, 2014).

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There is one thing software will never do:
replace teachers. Even the most
self-motivated student needs guidance
and support.

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United States, and they'll have an even bigger impact on teachers in developing countries where enrollment is high but achievement is not.

To make the most of these innovations, we need to close the gender gap. In Africa, women are 24 percent less likely than men to own a cell phone; in South Asia, it's 37 percent. And as Melinda has seen vividly in her travels, the gap is not just about technology. Last year she and our daughter Jennifer stayed with a family on their farm in Tanzania. Their 13-year-old daughter, Grace, couldn't start her homework until 10:30 at night—she was too busy chopping wood, carrying water, doing the laundry, cooking dinner, and washing dishes. Her twin brother, who had plenty of time to study, had already passed the exams needed to keep going in school.

As Melinda and Jennifer were leaving, Grace asked, "Can I have your flashlight?" She wanted to use it for studying at night.

Education is a great leveler. But if the factors that hold girls back are not addressed, and if access to education isn't equal, then education will become another cause of inequity, rather than a cure for it.

This is especially important because when a young woman gets an education, it has a powerful ripple effect. As an adult, she'll earn more money. If she has children, they will be twice as likely to live past the age of 5. Her daughters will be twice as likely to go to school themselves. There's no way to get around the fact that more girls need to be in good schools, and for longer. But online education will open up new opportunities for girls with the means and motivation to take advantage of it.

As the cost goes down and incomes go up, more people will have the means, and we'll be well on our way to providing high-quality education for everyone.

A CALL FOR GLOBAL CITIZENS

So what will it take to make sure this bet pays off—that the lives of people in poor countries really do improve faster in the next 15 years than ever before? As we said earlier, it will take innovation in technology and in ways to deliver it to the people who need it most, which is what our foundation works on.

There's another crucial factor: informed, passionate individuals working together to form effective movements for change. People who care about helping those in the world's poorest places improve their lives. We call them global citizens. And with this letter, we're helping to kick-start an effort to recruit tens of millions more of them.

Becoming a global citizen doesn't mean you have to dedicate your life to helping the poor. It does mean you follow an issue of global importance—whether it's one we wrote about in this letter, or another, like human rights or governance. You take a few minutes once in a while to learn about the lives of people who are worse off than you are. (In fact, if you're still reading this far into our letter, you are probably a global citizen.) You're willing to act on your compassion, whether it's raising awareness, volunteering your time, or giving a little money.

There is overwhelming evidence that people care about others who are suffering—when they can see the suffering. Just think of the global outpouring of support whenever a devastating tsunami or earthquake makes the news. The problem is that ongoing tragedies like deadly diseases and poverty don't make the news. They're invisible to many of us. And so the caring of millions of people goes untapped.

We hope to help change that. With the effort we're helping launch, we want to raise the visibility of these problems. We want to give global citizens a way to lend their voice, urging governments, companies, and nonprofits to make these issues a priority.

It is called Global Citizen, and you can sign up at GlobalCitizen.org. You will be able to get updates on how you can help, share what you're learning, and connect with other people and organizations who care about similar issues. But being a global citizen is not just about being part of one organization; it's about being part of a movement made up of many effective organizations including global groups like CIVICUS, Save the Children, the ONE Campaign, ActionAid, Oxfam, and Greenpeace, as well as smaller national organizations from Sri Lanka to South Africa. We hope this effort will help these groups grow, building the

movement of global citizens. Their millions of members are also global citizens, working on different global problems.

Global citizens have an especially important role to play this year. In September, the United Nations will agree on a set of goals about what should be done for the poor over the next 15 years. The UN did this once before, in 2000, and it was one of the best ideas for development either of us has ever seen. It focused the world on key measures of how many people get the basics of a productive life: good health and a chance to get an education and make the most of economic opportunities.



We hope the goals adopted this year continue that work. Nearly 1,000 organizations in 130 countries have come together to launch a campaign called action/2015 to make sure they do. But we need even more voices—and by joining Global Citizen, you can add yours. Along with other groups, Global Citizen will be asking their members to hold their leaders accountable for the goals they sign up for in September, particularly those relating to the health of women and children.

The more global citizens there are, and the more active and effective they are, the more progress the world will make. We hope you will show your support by signing up, because we believe that people can and must work together more to make the world a more equitable place. In fact, we're betting on it.

Bill & Melinda

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Co-chairs
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January 2015

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SLEEVE

Woman selling locust beans at a local
 market (*Osun state, Nigeria, 2009*).

COVER

(from top to bottom)

Boy eating an orange-fleshed sweet
 potato (*Mwasonge, Tanzania, 2009*).

A polio vaccination team at work
 in the Kamla Nehru Nagar slum
(Bihar, India, 2010).

Farmers tending their rice fields
(Kirehe District, Rwanda, 2011).

Students using computers at the
 Centro Tecnológico Comunitario to
 access interactive, digital schoolwork
(Boca Chica, Dominican Republic, 2012).

Young girl holding her little brother
(Hainan, China, 2008).

[From the New England Journal of Medicine, Apr. 9, 2015]

THE NEXT EPIDEMIC—LESSONS FROM EBOLA

(By Bill Gates)

The ongoing Ebola epidemic in Guinea, Sierra Leone, and Liberia is a huge tragedy. The impact on the 22 million people who live in those countries goes far beyond the Ebola deaths. The health systems and the economies of the three countries have been largely shut down during the outbreak. The world has a lot of work to do to make sure the case rate drops to zero—in the week leading up to March 1, 2015, there were 132 new confirmed cases reported. It will also need to make sure a good healthcare system is built and enough food and other basics are available. Without catch-up vaccination for the children who have not gotten vaccines during the epidemic, for example, the increase in measles deaths alone could outnumber the deaths from Ebola.

The only good news from this epidemic is that it can serve as a wake-up call to help us prepare for a future epidemic that spreads more effectively than Ebola does. There is a significant chance that a substantially more infectious epidemic will come along over the next 20 years; after all, we saw several of them throughout the 20th century, including the Spanish flu of 1918–1919, which killed at least 30 million people, and the ongoing HIV pandemic. In fact, of all the things that could surprise people in a negative way by killing more than 10 million people, by far the most likely is an epidemic, from either natural causes or bioterrorism.

Ebola is far from the most infectious disease we know about. During the epidemic, almost all of the secondary infections have taken place after the patient was very sick. Most people are infected while taking care of a patient at home or in a hospital, or by touching the body of someone who died from Ebola. This means there has been very little spread to strangers other than healthcare workers and those providing emergency transportation. This factor has helped keep the number of cases below 0.5 percent of the general population, and it allowed a few tactics—such as persuading infected people to get isolated and treated—to slow the epidemic.

By contrast, other disease agents (measles and flu, for example) are far more infectious because they can spread through the air, rather than by direct contact. People may not even be aware that they are infected or infectious. These agents make it possible to infect lots of strangers in the marketplace or on a plane, so the number of cases can get large very quickly. And successive waves of infections can come just days apart, leaving little time to mount an effective response.

When I heard that the Ebola epidemic had reached urban areas, I had a dreadful feeling that we might not be able to keep it from spreading to many more countries with weak health systems. It was only when I got a chance to start looking at the case data with colleagues at the Institute for Disease Modeling that I saw the relatively confined pattern of the infections and began to think the geographic spread could be controlled.

I am concerned that as the intensity of the problem fades from the world's attention, we will miss the opportunity to learn from the Ebola epidemic and be better prepared for the next one. Even if the system we have today worked perfectly, it would not contain a more infectious disease.

It's useful to compare our preparations for epidemics with our preparations for war. Defense budgets and investment in new weapons dwarf investments in epidemic preparation. NATO has a mobile unit that is ready to deploy quickly. Although it's not a perfect system, they do joint exercises where they work out basic logistics like how fuel and food will be provided, what language they will speak, what radio frequencies will be used. When soldiers sign up to serve, they know what the risks are and who will take care of them if they're injured or killed.

Few if any of these things exist for an epidemic response. The world does not fund any organization to do the broad set of coordinated activities that are needed for the next epidemic. The last serious simulation of an epidemic in the United States, the Dark Winter exercise, took place in 2001. The International Health Regulations (IHR), adopted by the United Nations after the SARS outbreak of 2002–2003, were intended to improve the world's ability to prevent and contain outbreaks. But few countries have met their commitments under the IHR. Nor have most countries established an Emergency Operations Center that can be activated within 2 hours of identifying an outbreak, a commitment made under the 2014 Global Health Security Agenda.

Because there was so little preparation, the world lost a lot of time trying to answer fairly basic questions about how to deal with Ebola. In the next epidemic, these delays could cause a global disaster.

The problem does not lie solely with any single institution—it is a global failure. The world needs a global warning and response system for outbreaks. (WHO has a group with a similar name—the Global Outbreak Alert & Response Network—but it is severely understaffed and underfunded.)

In this essay, I describe what I think that system might look like, based on lessons learned from the Ebola response. Many details will need to be worked out. I have not seen a rigorous projection for what a complete system like the one I describe would cost, but the World Bank has made some projections that give a sense of the cost of inaction. For example, it has estimated that a worldwide flu epidemic would reduce global wealth by \$3 trillion. It has also projected that Guinea, Sierra Leone, and Liberia will lose 12 percent of their GDP this year because of Ebola; if a global epidemic were as costly, the worldwide impact would be more than \$7 trillion, not to mention the immeasurable misery caused by millions of deaths.

The key point is that the world is not nearly as prepared for a massive epidemic as it needs to be. While Melinda and I remain committed to our work on improving the health of the poorest, I hope this paper—in spite of whatever shortcomings it has—helps spark conversation and action to prepare for an epidemic that could have global consequences.

PUBLIC HEALTH AND PRIMARY HEALTHCARE SYSTEMS

There is a critical need to reinforce basic public health systems. These are fundamental systems that include primary healthcare facilities, laboratories, surveillance, critical care facilities, etc. As many commentators have pointed out, Ebola has spread much faster and more widely in countries whose health systems, and especially primary care systems, were severely weakened by years of conflict and neglect. Countries with stronger health systems have been able to respond more quickly.

Strengthening primary healthcare systems provides a double benefit. One, it improves our ability to prevent, detect, and respond to epidemics. The other benefit is to health more broadly. Primary healthcare facilities are where women go to seek preventive services like family planning and vaccinations for their children, and to get treatment for a sick child. Without a functioning health system—including adequate numbers of trained health workers, good supply chains, disease surveillance, information systems, and policies that enable access by the poor—it is very hard for a country to end the cycle of disease and poverty.

Good health is so fundamental to well-being and development that even if there were no chance of another epidemic ever occurring, healthcare systems would be a worthwhile—and life-saving—investment. The fact that they also bolsters our ability to deal with the next epidemic is all the more reason to invest in them.

DISEASE SURVEILLANCE

There is no systematic disease-surveillance process in place today in most poor countries, which is where a natural epidemic seems most likely to break out. The Zaire strain of Ebola had not previously been seen in West Africa, so the region wasn't as prepared as central Africa, where it has shown up more than 20 times over the past several decades. Although Médecins Sans Frontières (MSF) reported a rise in Ebola cases in Guinea last spring, there weren't adequate resources on standby to go into the area and do the requisite sampling to determine how widespread the outbreak was. Even once the crisis was recognized, there weren't resources to effectively map where cases were occurring and in what quantity.

We need to invest in better disease surveillance and laboratory testing capacity, for normal situations and for epidemics. Routine disease surveillance systems should be set up so they can detect early signs of an outbreak beyond their sentinel sites and be efficiently and quickly scaled up during epidemics. They should be tied in to the national public health laboratories to enable robust monitoring and response as part of a country's healthcare system. The data derived from the testing needs to be made public right away. A lot of the laboratories in developing countries have been financed by the polio eradication campaign, so there should be a plan for what capacities we need once that campaign is over.

PERSONNEL

Once it became clear that a serious emergency was under way, recruitment of local clinicians and the flow of trained personnel into the affected countries should have been very high. It wasn't. There was no comprehensive plan for what was needed. No training centers were standing by. The United States, Cuba, China, and other countries stepped forward with volunteers, but few of them were trained in what treating Ebola patients effectively would entail. All of this happened over 2

to 3 months, when it needed to happen within days. It is fortunate that MSF was able to mobilize volunteers faster than any of the governments.

We need trained personnel ready to deal with an epidemic quickly. One approach is to think of them in three tiers: (1) an incident manager for each Emergency Operations Center (EOC), in charge of coordinating efforts by the medical care providers, military, volunteers, and others at the country level; (2) experts in epidemiology, surveillance, outbreak response, social anthropology, and other areas who can provide surge capacity for the response; and (3) respected community leaders who can lead the local engagement efforts and community workers who can implement programs and give accurate information to the public in local dialects.

There should be updated lists of people at all levels—especially the first two—documenting their availability and capabilities. There should be standby training centers and a plan to quickly recruit community leaders as soon as the EOC is activated. There should be an explicit understanding about how to compensate and insure the volunteers, and information about what is expected of them so they can decide very rapidly whether to sign up. Countries should commit to manage a pool of volunteers and send a certain number of people with various skills and equipment within a week of an emergency, with plans for evacuating them if they are exposed. We should also leverage the talent at schools of public health around the world. The earliest people to go in should be surveillance experts, logistics experts, and clinical staff. Finally, countries should have plans in place for supporting volunteers when they come back. In this epidemic, returning health workers have lost their jobs and experienced discrimination, which may have made others reluctant to sign up.

TRANSPORTATION AND EQUIPMENT

When an epidemic strikes, transportation will be a critical problem. Roads and airports in affected areas will be overwhelmed by swarms of people trying to get out. Volunteers will be more likely to sign up if they know they will be able to get out when their duty is done or if they get sick.

There are very few organizations in the world that can move thousands of people to different locations on the globe with a week's notice—especially given that, in an epidemic, some of the transport needs onboard isolation so that passengers can't infect each other or the crew. The United Nations has to borrow transportation equipment to support its military missions. The World Food Programme can move people and food during a famine but has nowhere near enough capacity for an epidemic.

The Ebola epidemic might have been a lot worse if the U.S. and U.K. Governments had not used military resources to help build health centers, manage logistics, and fly people in and out of the affected countries. The militaries also provided command and control capacity to help organize the different groups working on Ebola. It is fortunate that they were not too busy with other emergencies to help out, and that the Ebola epidemic is happening in countries that are open to working with them. We should not assume that this will always be the case.

The world should identify trained military resources that will be available for epidemics. In a severe case, almost every middle-income and rich-world military would have to come together with their resources. Countries might hesitate to deploy resources abroad that might be needed at home, which could create a paradox where the world allows an epidemic to spread from the primary sites and reach lots of countries.

Transportation is not the only critical resource. Severe epidemics also require tents, protective suits, bleach, portable power sources, portable air conditioning, medical supplies, and more. We should have a list of supplies needed to stop an epidemic that reaches 10 million people, which would be 100 times what we experienced in the Ebola epidemic. Because face masks, protection suits, medical tents, and other medical supplies could see extreme demand, there should be an analysis of which items need to be stockpiled or subject to being commandeered so we don't run out. Militaries and agencies that deal with humanitarian crises stockpile items like these for natural disasters and refugee crises, and they should get support for expanding their supplies to what is needed for epidemics.

I have experience with one item that—although it wasn't critical—shows how unclear the decisionmaking process is. By early September, it was apparent that health workers in protective suits would get so hot that it was difficult for them to care for their patients. I asked a group of people who work for me on technology for keeping vaccines cold to refocus on keeping the medical workers cool. Within days, they had found existing commercial and military technology that could help. But there was no unified mechanism for getting this equipment to the treatment centers. The team had to create new distribution channels by working directly with

local treatment centers and organizations like Partners in Health and MSF. I am not saying this was a critical issue, but it illustrates how there was no coordinated process for getting new equipment designed and distributed to the people who need it.

DATA SYSTEMS

Given all of the actors involved in an epidemic and the importance of allocating resources quickly and efficiently, it is critically important to have good data about what's going on. Unfortunately during the Ebola epidemic, the case database has not always been accurate or up to date. Some of this is because of the chaos of the situation, but it is also because there isn't good technology and training available or clear rules about making the data accessible.

Today the default is that countries must sign off on making data about their citizens available, but because that process is unclear, it happens slowly or not at all. For future epidemics it should be possible to have a system to digitally enter information like suspected cases, locations, survivors, etc. into a database that is instantly accessible to organizations engaged in the response and the agencies coordinating their work. The rationale for not waiting for each country to release the information is clear: An accessible database would be a critical global public good. The groups that work on the Ebola data—including WHO, the CDC, and others—could write up a specification or revise the International Health Regulations for what we need next time. Based on what we've learned with Ebola and polio, I think some combination of foundations and technology companies can find the resources to make sure a robust system, including the training materials and back-end systems, comes together within the year.

Experts will also need computer models to predict what might happen and which interventions should be prioritized. The ideal is to have multiple strong modeling groups who can focus full-time attention on an outbreak. They should have access to satellite photography and analysis so they can understand how people are moving in the region. And with appropriate privacy safeguards in place, cell phone records can help modelers understand population counts, social connections, and movement.

If the data systems are going to work, we also need to improve Internet and cell phone connectivity. During the Ebola crisis, there has been a lot of discussion about enhancing the Internet and cell phone networks in the affected areas, but there was far too little progress. As a result, much of the case reporting has been done on paper and then sent to a central location for data entry. We should be able to use cell phone systems to get messages out to everyone and to poll people about what they are seeing. Key centers should have high-bandwidth Internet capacity via satellite, and wi-fi capacity should be added in key areas so that digital tools can help with reporting data and coordinating personnel. Rapidly deployable systems should be available to quickly increase capacity in crisis areas.

MEDICAL TOOLS

Among the pathogens we know about, flu is the most likely to cause a big epidemic. But we could also encounter one we have never seen before. In 2003, for example, no scientist had seen SARS. That year it infected some 8,000 people and killed 800.

Making sure that prophylactics and treatments are available for key personnel (police, health workers, pilots, etc.) and volunteers could make a gigantic difference in stopping an epidemic and limiting the damage it does. The good news is that there is a lot of scientific work that can be done that is not specific to a particular pathogen and enables faster response to a wide variety of infectious agents. It should be possible to have general capabilities to make diagnostic tests as well as drugs, and vaccine platforms that could be adapted for use against various pathogens. Today, with the possible exception of flu, we do not have nearly enough capacity to do this.

One problem is a lack of incentives. Pharmaceutical companies and others in the private sector face an opportunity cost in shifting resources (including their researchers) away from more commercially viable projects to work on drugs or vaccines for epidemics that may not happen. Their work represents a kind of insurance policy against the next epidemic, and there may need to be an international system for funding it that factors in these opportunity costs.

There are three key areas of medical tools that will be important for the next epidemic: diagnostic tests, therapeutics, and vaccines.

DIAGNOSTIC TESTS

When a new epidemic breaks out, one of the most urgent tasks is to obtain and analyze biological samples—including blood, saliva, nasal swab, and stool—to determine what is causing the disease. Those samples start the process of figuring out how to make diagnostic tests, drugs, and vaccines. The samples will be tested, the pathogens sequenced, and all of that data should be immediately published digitally for the world's scientists to study. Fairly quickly it should be possible to see the signature of the disease and determine whether the pathogen is a virus, bacterium, or something else.

It's extremely important to have an accurate diagnostic test that can determine whether someone is infected. The ideal test, which is being developed, will be one where you take a sample and get a definitive result within 20 minutes. People who are infected can be sent to treatment centers so they are isolated from the uninfected. If getting results takes more than a day—because the testing capacity is overloaded, or the transport of the sample to the testing service is slow, or the test process itself takes a lot of time—then holding people while you wait to get the answer is very difficult.

Other than watching for symptoms (which are a clinical diagnostic test, albeit a bit late), most of the diagnosis during this Ebola epidemic has been done by taking a blood sample and sending it off for quantitative polymerase chain reaction (qPCR) analysis. Availability of these expensive qPCR machines is limited and centralized, so on average it has taken one to three days for test results to come back after a sample is collected and sent out. For the next epidemic, we should make sure adequate qPCR machine are made available or mobilized in the first few weeks (with trained technicians and supplies), while novel diagnostic methods are rapidly developed. A number of diagnostic companies have technologies that are cheaper, more portable, and faster and requires less expertise than qPCR. When you move to a new format, though, you have to be sure that the biomarker and your sensitivity to that marker are not compromised—otherwise you could miss early disease and allow infected people to be identified as uninfected.

In the future there should be a clear process for taking the information about disease signature and then developing and manufacturing accurate diagnostic tests very rapidly. A focused effort to accelerate this process and establish a rapid approval and procurement process would be worthwhile. The science of bio-diagnostics is advancing rapidly, so there is a good chance that a proven test could be produced at scale within weeks of an outbreak.

THERAPEUTICS: ANTIVIRALS, ANTIBODIES, RNA, TRANSFUSION

It is hard to overstate the value of having a drug that reduces the duration and degree of infectiousness and saves lives. Infected people are more likely to come to a treatment center if doing so will increase their odds of surviving, rather than just preventing them from infecting others. Survivors from the treatment center would likely be immune from getting sick again, so they could go back to the affected regions to help inform people about the importance of seeking treatment.

There are drugs that work against viruses that are similar to Ebola, and in various test assays, a number of them show an effect against Ebola. Unfortunately, they were not tested in Ebola patients until after the peak of the epidemic. This was partly because there wasn't a clear decision process to approve a novel trial format and to provide indemnity against legal liability. The role of the local governments relative to the global actors remains unclear, but it is not hard to imagine local authorities being inundated with suggested therapies, as happened with this epidemic. There should be a clear set of guidelines (and testing and regulatory pathways) for figuring out whether existing drugs could be re-purposed to help stop a particular epidemic. This testing should be carried out as soon as possible—we can fill the pipeline now with the best options so they are ready to be used in a future outbreak.

We also need to invest in more research on antiviral drugs and have either stock-piles or rapid manufacturing capacity for those that might be effective in an epidemic. The search for drugs against HIV, which started in the 1980s, has contributed a lot to the field of antiviral drugs. The number of antiviral drugs that perform well against HIV is quite impressive. Since the next epidemic will probably be caused by a virus, general work on broad-spectrum antiviral drugs is a global public good that needs more research than is being done.

There is a special class of therapies that are based on antibodies. For example, Zmapp was specifically designed for treating Ebola patients. This is another intervention that was given to many of the patients who were treated in the United

States and Europe, but it was not made in sufficient volume quickly enough to help in Africa.

Because of the small number of treated patients and lack of an adequate control group, we don't know which interventions were key to the higher survival rates in the United States and Europe. Still, the evidence suggests that antibody-based approaches will probably be valuable for the next epidemic. We need to improve our ability to design an antibody against a new pathogen and make sure that it is applied along with new rapid manufacturing techniques and a clear regulatory pathway to maximize the chance of success. Manufacturing capacity for making antibodies at scale will have to be set aside or subject to being commandeered during an epidemic. We should also leverage approaches like adeno-associated virus (AAV) vectors, which use a harmless virus as a backbone to explore generating robust antibody levels.

Another special class of drugs involves giving patients a set of particular RNA-based constructs that enables them to produce specific proteins (including antibodies). Although this is a very new area, it is promising because it is possible that a safe therapy could be designed and put into large-scale manufacture fairly rapidly. More basic research as well as the progress of companies like Moderna and CureVac could eventually make this approach a key tool for stopping epidemics.

There is one approach that should have been applied for this Ebola epidemic, but it wasn't approved and scaled up until it was too late to have a large impact. It involves taking the blood of survivors, extracting the plasma from it (plasmapheresis), and giving the plasma—or the immunologically potent parts of it—to people who have early symptoms of disease or who are at high risk of contracting it. Depending on the disease, a single survivor should be able to provide protection for at least one person every 2 weeks.

This process is quite effective for a number of diseases. It was very effective with smallpox and viral hemorrhagic fevers, including treating a patient in the United States who had Lassa fever in 1969. It has a reasonable chance of working for Ebola as well. It was used to treat 8 patients during an Ebola outbreak in Zaire in 1995, but because it wasn't done as an organized trial, we don't know for sure whether it worked. Subsequent animal experiments had mixed results.

The Gates Foundation started working to get plasmapheresis units going in early September and quickly found partners with equipment ready to take it into the affected countries. Unfortunately, the effort was hampered because there was no clear process for approving new approaches, or for exporting plasma to other countries to be processed and then getting it back to the patients who needed it. By the end of 2014, only a few patients in West Africa had been treated with convalescent plasma, which means the sample size is too small to determine whether it was effective. (This treatment was given to some of the Ebola patients who were lucky enough to be treated in rich countries.)

For future epidemics, there need to be rules in advance for all medical interventions and a clear assignment of responsibility for approving studies and treatments, including experimental ones. One of the critical elements would be to obtain specimens (e.g., blood) from infected individuals to isolate samples of the pathogen and also to fish out high-affinity antibodies. Then we should be able to quickly leverage the sequence information of the antibodies to test novel approaches and determine what might work quickly and be safe. A Global Epidemic Drug Approval process could avoid long delays by indemnifying companies working on new approaches and enabling decisionmaking around “permission to use” of investigational medical products.

For transfusion in particular, there needs to be ample equipment easily available, as well as a process for quickly getting donor plasma to facilities for processing and then returning the finished product to the affected populations. There is a good chance that the plasma transfusion could work as a therapeutic and have a dual impact on the potential disease as well as empower local populations to engage in the outbreak responses.

VACCINES

Three different Ebola vaccine constructs were being developed in the summer of 2014, but all were in early stages and had not reached Phase 1 safety testing. The normal process for going from Phase 1 to full approval for sale and use would have taken at least another 5 years. Even the accelerated process adopted for the epidemic will require more than 9 months. Ironically, by the time of the final phase of testing—which measures effectiveness in a large population—there will likely be too few people still being exposed to Ebola virus to know reliably how effective these vaccines are.

Because of this early work, we were more prepared for Ebola virus than we would be for a new pathogen. If the pathogen hasn't been seen before, at least another year of work would probably be needed. And the issues of how quickly to move and who should finance the final research and the manufacturing are not as clear as they should be.

With the seasonal flu, we know how to make vaccines against specific antigenic forms of the virus, but even the relatively minor season-to-season variations are significant enough that we have to design a new vaccine each year. When a very different antigenic variant like H1N1 (the swine flu of 2009) comes along, there is no clear process for getting resources applied to creating a new vaccine. In fact, after the swine flu scare—where WHO worked with pharmaceutical companies to create and buy a stockpile of vaccines—some people criticized WHO for doing too much, a stark contrast with the complaints that it did too little on Ebola. Given that flu is the most likely single known pathogen to cause a large epidemic and that even the seasonal variations likely cause several hundred thousand excess deaths each year, it is disappointing that we don't have a vaccine that works on all variants of flu. There is work being done toward this goal, but with nowhere near the resources that it deserves.

I have a bias towards vaccine research because of the impact I see from vaccines in the Gates Foundation's work on preventing disease. Many of the same legal and regulatory barriers that slow down the approval of therapeutics also apply to vaccine candidates. We should establish clear guidelines to avoid these hurdles during emergencies. The ideal would be to fund vaccine research so that a vaccine can be designed, tested for safety, and ready for manufacture in large volumes in a matter of a few months. There is no guarantee of success, but given enough time—probably no more than a decade—and enough resources, I think this effort could produce an invaluable contribution to both promoting overall health and preventing epidemics.

QUARANTINE AND COMMUNICATIONS PLANS

During the Ebola epidemic there was a lot of discussion about quarantine. Should commercial flights into and out of the affected countries be stopped? Should people returning from the affected region be forced into quarantine? For this epidemic, given the limited infectiousness of Ebola in the early stages of the disease, most of these proposals would have been counterproductive. Banning travel from affected areas to the United States, for example, would have forced people to take an indirect route, making them harder to track once they arrived. Forcing people into quarantine would have discouraged volunteers from working in the affected countries. Basic monitoring procedures were adequate to determine whether patients were developing Ebola and get them into isolation before they infected others.

But when a far more infectious agent comes along, quarantine will be one of the few tactics in the early stage of the disease that can reduce the spread of contagion. Travel today is so common that an infection can spread across the globe far faster now than in 1918, when the Spanish flu epidemic swept across the world. During the SARS epidemic, China eventually did a good job of curtailing travel and public gatherings in affected areas. I doubt every country would have handled this aspect as well as China did, because in normal situations the system is designed to avoid abridging individual rights to travel and assemble freely. I worry that in the early stages of an epidemic, democratic countries might be too slow to restrict activities that help spread the contagion.

Part of the process should include a plan for effective public communications. There will be lot of panic and thirst for information when the epidemic hits. Many people will be tempted to tie up health and transport assets when they should not. Well-designed quarantine plans need to be part of an overall outreach plan that coordinates all the different voices people will hear: governments, U.N. agencies, news media, bloggers, etc. The ways that people communicate digitally can be used to great advantage, but unless a plan is in place ahead of time, they will just spread confusion and panic faster than in the past—perhaps at the cost of many lives.

BIOTERRORISM

I chose to focus this essay on the lessons from a natural epidemic. But an epidemic could also be engineered intentionally. As biological science and technology advances, it is getting easier to create (or re-create) pathogens with only modest effort and technical knowledge. Over the next few decades it will be even more feasible to synthesize, mass-produce, and disseminate pathogens that are highly infectious and largely fatal. (Because Ebola doesn't spread very effectively, it would not make a highly effective bioterror weapon.) Everything I have described in this essay would also be worthwhile in preparing for bioterrorism. Nathan Myhrvold discusses

these challenges in his essay on strategic bioterrorism, which I highly recommend—although it is sobering to read.

A GLOBAL CALL TO ACTION

The world spends a great deal of money—hundreds of billions of dollars a year—getting ready for war. I am not saying this is a mistake, but given that an epidemic is more likely to kill millions of people than a future war, I believe we should build on these efforts so we can be more prepared for a severe epidemic. Some of the capabilities, like transport and some personnel, overlap and can play a dual purpose if properly planned. Other elements, like research on diagnostic tests, vaccines, and treatments, will require specific investments.

A serious epidemic would also raise a lot of questions about global governance. What body would bring sovereign nations together and ask them to make decisions about limiting travel and allocating scarce resources like vaccines or drugs? All of the epidemics we have seen so far have shown that we desperately need processes for making tough decisions fast.

One technique that we should borrow from the military is the idea of a war game. Once we have taken action on the basics, countries should come together every few years to simulate different types of epidemics so they can understand what is missing from the response.

I worry that many people do not think a serious epidemic is a problem for them to worry about. They may think that the United Nations system, and especially WHO, has it covered. In fact, WHO has not been clearly chartered or funded to handle most of the things required in an epidemic. Or they may think their government has a plan already in place. While the United States, the United Kingdom, and others are working on many of the things described in this memo, there are still big holes in the world's ability to respond.

There should be a rigorous study of the cost of building a global warning and response system for epidemics, including greater investments in research and development, preparing military resources for epidemic response, and maintaining a reserve of paid responders who go through regular training exercises. There would need to be a plan for how much each country would contribute and for coordinating the spending so it is used effectively. I think other countries need to step up, but they are more likely to do so when they see an overall plan and understand their role in it. Rich, technically advanced countries should invest far more in the key research and manufacturing capacities than they do today. Most of the others can contribute to the crucial surveillance work.

Through the United Nations, some global institution needs to be empowered and funded to coordinate a global warning and response system—including systems for sharing data, managing personnel, setting an R&D agenda, and other key areas. At the request of WHO's Executive Board, Director-General Margaret Chan is evaluating the organization's response to the recent Ebola outbreak. U.N. Secretary-General Ban Ki-moon is commissioning a high-level panel to recommend ways to improve international crisis management, with a special focus on health based on the lessons learned from the Ebola response. These evaluations would be a good place to start a much-needed conversation about how to strengthen WHO's capacity and about which pieces it should lead and which should be led by others (including the World Bank and G7) in close coordination with it. The conversation should include military alliances such as NATO, which should make epidemic response a priority when they are designing strategies, training troops, and buying equipment. The final arrangement should include a reserve corps of experts with the broad range of skills needed in an epidemic.

In my view, an epidemic is one of the few catastrophes that could set the world back in a huge way in the next few decades. Severe epidemics have struck many times in the past, and they are only more likely as the world becomes more closely connected. By building a global warning and response system, we can prepare for the next epidemic and avoid millions of deaths.

RECOMMENDATIONS

The world needs to build a warning and response system for outbreaks. This system should:

- Be coordinated by a global institution that is given enough authority and funding to be effective.
- Enable fast decisionmaking at a global level.
- Expand investment in research and development and clarify regulatory pathways for developing new tools and approaches.

- Improve early warning and detection systems, including scalable everyday systems that can be expanded during an epidemic.
- Establish a reserve corps of trained personnel and volunteers.
- Strengthen health systems in low- and middle-income countries.
- Incorporate preparedness exercises to identify areas for improvement.

[From the New York Times, Mar. 18, 2015]

HOW TO FIGHT THE NEXT EPIDEMIC

THE EBOLA CRISIS WAS TERRIBLE. BUT NEXT TIME COULD BE MUCH WORSE.

(By Bill Gates)

SEATTLE.—The Ebola epidemic in West Africa has killed more than 10,000 people. If anything good can come from this continuing tragedy, it is that Ebola can awaken the world to a sobering fact: We are simply not prepared to deal with a global epidemic.

Of all the things that could kill more than 10 million people around the world in the coming years, by far the most likely is an epidemic. But it almost certainly won't be Ebola. As awful as it is, Ebola spreads only through physical contact, and by the time patients can infect other people, they are already showing symptoms of the disease, which makes them relatively easy to identify.

Other diseases—flu, for example—spread through the air, and people can be infectious before they feel sick, which means that one person can infect many strangers just by going to a public place. We've seen it happen before, with horrific results: In 1918, the Spanish flu killed more than 30 million people. Imagine what it could do in today's highly mobile world.

Much of the public discussion about the world's response to Ebola has focused on whether the World Health Organization, the Centers for Disease Control and Prevention and other groups could have responded more effectively. These are worthwhile questions, but they miss the larger point. The problem isn't so much that the system didn't work well enough. The problem is that we hardly have a system at all.

To begin with, most poor countries, where a natural epidemic is most likely to start, have no systematic disease surveillance in place. Even once the Ebola crisis was recognized last year, there were no resources to effectively map where cases occurred, or to use people's travel patterns to predict where the disease might go next.

Then, once it became clear that a serious emergency was underway, trained personnel should have flooded the affected countries within days. Instead it took months. Doctors Without Borders deserves a lot of credit for mobilizing volunteers faster than any government did. But we should not count on nonprofit groups to mount a global response.

Even if we signed up lots of experts and volunteers right away, it's not clear how we would deploy them quickly into the affected area, or how we would transport patients. Few organizations are capable of moving thousands of people, some of them infected, to different locations on the globe with a week's notice.

The Ebola epidemic might have been a lot worse if the United States, Britain and other governments had not used military resources to fly people and equipment into and out of affected areas. But we should not assume that the next epidemic will limit itself to countries that welcome Western troops.

Data is another crucial problem. During the Ebola epidemic, the database that tracks cases has not always been accurate. This is partly because the situation is so chaotic, but also because much of the case reporting has been done on paper and then sent to a central location for data entry.

Then there's our failure to invest in effective medical tools like diagnostic tests, drugs and vaccines. On average it has taken an estimated 1 to 3 days for Ebola test results to come back—an eternity when you need to quarantine people until you know whether they're infected. Drugs that might help stop Ebola were not tested in patients until after the epidemic had peaked, partly because the world has no clear process for expediting drug approvals.

Compare all this to the preparation that nations put into defense. Armies have systems for recruiting, training and equipping soldiers. NATO has a mobile unit that is ready to deploy quickly. Although the system isn't perfect, NATO members do joint exercises where they work out logistics like how troops will get food and what language they will use to communicate.

Few if any of these approaches exist for an epidemic response. The world does not fund any organization (not even the W.H.O.) to coordinate all the activities needed to stop an epidemic. In short, in a battle against a severe epidemic, we would be taking a knife to a bazooka fight.

I believe that we can solve this problem, just as we've solved many others—with ingenuity and innovation.

We need a global warning and response system for outbreaks. It would start with strengthening poor countries' health systems. For example, when you build a clinic to deliver primary healthcare, you're also creating part of the infrastructure for fighting epidemics. Trained healthcare workers not only deliver vaccines; they can also monitor disease patterns, serving as part of the early warning systems that will alert the world to potential outbreaks. Some of the personnel who were in Nigeria to fight polio were redeployed to work on Ebola—and that country was able to contain the disease very quickly.

We also need to invest in disease surveillance. We need a case database that is instantly accessible to the relevant organizations, with rules requiring countries to share their information. We need lists of trained personnel, from local leaders to global experts, prepared to deal with an epidemic immediately. We need trained military resources ready to respond, and a list of supplies to be stockpiled or commandeered in an emergency.

Finally, we need to invest far more in research on drugs, vaccines and diagnostic tests, and make it possible to accelerate the approval of new approaches in times of crisis.

The United Nations should empower and fund a global institution to coordinate these efforts. The United Nations and the W.H.O. are studying the lessons of this epidemic; their evaluations would be a good starting point for a conversation about how to strengthen the W.H.O. and what pieces of the system it should lead.

I have not seen a rigorous projection for what a system like this would cost. But we know the cost of failing to act. According to the World Bank, a worldwide flu epidemic would reduce global wealth by \$3 trillion, not to mention the immeasurable misery caused by millions of deaths. Preventing such a catastrophe is well worth the world's time and attention.

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